

Purchase intentions and quality perceptions of suboptimal fruits and vegetables



("Buitenbeentjes", n.d.)

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Abstract

When food is produced but not used for human consumption, natural resources are wasted. In order to reduce a part of the food waste, suboptimal fruits and vegetables should be prevented from being discarded. This research aims to investigate how purchase intention could be increased by assessing the influence of quality perception and whether price and scarcity incentives play a role in increasing purchase intention. Analysing a survey with 213 respondents, the main results are that quality perception drives purchase intention, but purchase intention is negatively influenced by the price of these products. Besides, quality perceptions of suboptimal products compared to optimal products do not vary, indicating that consumers do not differ between the two. Hence, consumers and supermarkets should together reconsider what they consider as suboptimal. They need to share responsibility and work together in order to reduce food waste.

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1 Introduction

Approximately 1.3 billion tonnes of food get lost or wasted worldwide annually, as reported by Gustavsson et al. (2011). Statistics from the United Kingdom report that about 25-40% of food waste comprises fresh fruits and vegetables (Stuart, 2009). One of the sources of food waste is that fresh vegetables and fruits are easily discarded when they do not meet the quality standards set by retailers, as supposed by Gustavsson et al. (2011). Retailers retain the right to reject portions (or even entire batches) of crops, if the physical appearance of the products is suboptimal (Stuart, 2009). This suboptimality means all suboptimal features of a product that do not affect its quality, such as odd colours and shapes.

Wasting food has a negative impact on the environment and on ethical aspects. As the production of foods requires scarce production factors, such as energy (for example transportation), water and land, the waste of food has negative effects on the environment (Nellemann, 2009). Next to environmental consequences, food waste has ethical consequences too. In some parts of the world people are suffering from malnutrition (currently over 800 million people) (FAO, 2015), while at the same time, other parts are challenged by over-supply of food which might be wasted because of suboptimality. Food waste in developed countries on the one hand, and malnutrition in undeveloped countries on the other hand, is, from an ethical point of view, unacceptable (Gjerris & Gaiani, 2013).

One of the sources of food waste appears to be consumers' low tendencies to buy and consume suboptimal fruits and vegetables, compared to optimal fresh fruits and vegetables (de Hooge et al., 2017; Loebnitz et al., 2015). To assess the quality of a product such as fruits and vegetables, consumers tend to rely on intrinsic cues (physical properties of the product itself) and extrinsic cues (all other product attributes) (Zeithaml, 1988). Part of these extrinsic cues are shape and colour (Creusen & Schoormans, 2005), which, for suboptimal fruits and vegetables might be the reason why suboptimal fruits and vegetables are associated with a

lower quality than optimal shaped fruits and vegetables. This lower quality perception might lead to a lower purchase intention (Grunert, 2005). Which might eventually lead consumers to reject the product as a purchase option. Moreover, a lower purchase intention is linked with a lower consumer demand (Grunert, 2005), and a lower consumer demand might lead to the waste of these foods throughout the whole supply chain.

In order to reduce the consequences of food waste of suboptimal foods, some supermarkets are experimenting with solutions to reduce the waste of suboptimal fruits and vegetables. A study of Aschemann-Witzel et al. (2017) on success factors of food supply chains shows multiple initiatives of supermarkets trying to tackle food waste. For example, in 2014 the French retailer Intermarché started selling suboptimal ‘inglorious’ fruits and vegetables. Intermarché calls its products ‘inglorious’ and sells its products below the price of optimal fruits and vegetables (Aschemann-Witzel et al., 2017). This seems to be a good marketing strategy to easily get rid of these products, however, from a cost perspective this does not seem to be a viable option for the supply chain. For the supply chain, processing suboptimal products would imply additional costs, because of standardization in packaging, suboptimal products will not fit and additional package costs will apply (Göbel et al., 2015). In order to solve this cost problem for the supply chain, the purchase intention and the quality perception of suboptimal fruits and vegetables should be higher.

The current research studies two new ways to increase quality perceptions and purchase intentions of suboptimal fruits and vegetables. First, marketing a product at a higher price than comparable products, is argued to increase the quality perception of a product (Monroe, 1973), because price is an extrinsic cue. Therefore, introducing a higher price for suboptimal fruits and vegetables might not only have a positive effect for the supply chain but also for the quality perception of suboptimal fruits and vegetables.

Another technique to increase the quality perception of fruits and vegetables might be the principle of scarcity (Cialdini, 2001). Consumers argue that the things that are difficult to possess are typically of a better quality than those that are easy to possess. Thus, an item's availability helps us to quickly decide on its quality. Applying this to suboptimal fresh fruits and vegetables consumers might think of suboptimal fresh fruits and vegetables as higher quality if there would be an extrinsic cue which would make clear that suboptimal fruits and vegetables would be less available compared to when this extrinsic cue would not be present. However, because of insufficient research on this topic, it is still unclear whether price and scarcity effect have a positive influence on quality perceptions of consumers and whether this influences purchase intentions when it comes to suboptimal fruits and vegetables. The present study aims to investigate whether price and scarcity of suboptimal fruits and vegetables influence consumers' quality assessments and purchase intentions of suboptimal fruits and vegetables. By gaining more knowledge in the field of products that are suboptimal, and therefore easily wasted, these products can be marketed in such a way that more of them will be consumed instead of being wasted. Wasting less of a product leads to a lower production, reducing environmental pressures of pollutive production. Thereby, this study contributes to the drive toward environmental friendly lifestyles and green consumption.

2 Literature

2.1 Suboptimal Product

Fruits and vegetables which are wasted at retail level but are still edible are referred to as “suboptimal fruits and vegetables”. Defined as: “Foods which consumers perceive as relatively undesirable as compared to otherwise similar foods because they deviate from what is regarded as optimal (usually equal to what is perceived as “optimal”)” (Aschemann-Witzel et al., 2015). Consumers show a lower purchase intention for suboptimality in both shape and colour for these fruits and vegetables (Loebnitz et al., 2015). Consumers’ first sensory impression of a product is constituted by the visual appearance or shape of food, resulting in particular inferences about the quality of a food product (Bitner, 1992; Bloch, 1995). For fruits and vegetables that have an odd colour or shape, such as suboptimal fruits and vegetables, this leads to a lower purchase intention (Loebnitz et al., 2015). A lower purchase intention causes a great part of suboptimal fruits and vegetables not to be sold and therefore to be wasted. If consumers would be unaware of the quality of these suboptimal fruits and vegetables, it implies that retailers haven’t convinced consumers of the worth of these products yet. And therefore, techniques to increase the quality perception and the purchase intention for suboptimal products should be explored.

2.2 Scarcity effect

In Cialdini’s (2001) book on *Influence: Science and Practice*, Cialdini describes the principle of scarcity as “opportunities which seem more valuable to us when they are less available”. The scarcity principle discusses two important techniques. The first is the deadline technique which puts an official time limit on the availability of a product. The second technique is the limited-number technique, which creates added value to a product by reducing the availability of the product. An example of research on the second technique of the scarcity principle is

shelf-based scarcity. Shelf-based scarcity in the form of relative stocking level depletion significantly affects consumer preferences, according to Van Herpen et al. (2009). In their research, consumers were asked to choose a bottle of wine from a shelf with different types of wine, where one shelf was only half filled with wine bottles. The latter type of wine was chosen significantly more compared to other fully filled shelves of wine. It is unknown whether the effect of shelf-based scarcity is applicable to suboptimal fruits and vegetables, but the present study aims to investigate the effect of scarcity on purchase intentions of fresh fruits and vegetables. Shelf-based scarcity will, in this research, be referred to as scarcity.

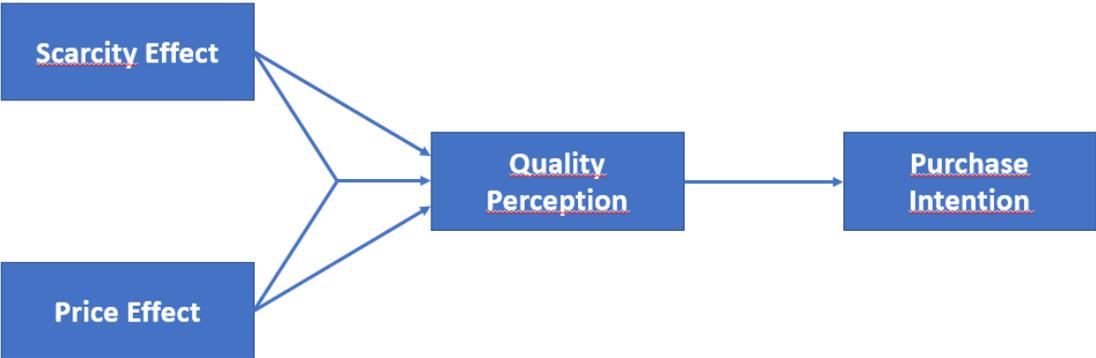


Figure 1: A framework for examining the relationship between quality perception and purchase intention, and how this quality perception is influenced by both the scarcity effect and price effect.

2.3 Scarcity effect on quality perceptions

The quality of fresh fruits and vegetables is assessed by various cues, according to cue utilization theory of Olson (1978). Consumers assess a products' quality by relying on intrinsic and extrinsic cues (Szybillo & Jacoby, 1974). Intrinsic cues involve the physical composition of the product (Zeithaml, 1988). Part of key intrinsic appearance cues are both shape (Wansink, 2004) and colour (Bello Acebrón & Calvo Dopico, 2000). These cues can't

be changed as, for suboptimal fruits and vegetables, one can't cut off abnormalities or re-shape the suboptimal product. As nothing can be done on intrinsic cues in themselves, the evaluation of intrinsic cues could be altered by extrinsic cues (Clemente et al., 2013; Mandler, 1982; Meyer-Levy & Tybout, 1989). Extrinsic cues are product related, but not part of the physical product itself. They are, by definition, outside the product. Price, brand name, and level of advertising are examples of extrinsic cues, used for assessing a products' quality. Even though availability of a product is not explicitly mentioned as an extrinsic cue, it might tell something about a products' quality. A consumer might take into account what others are buying. Availability might imply that the product is bought more or less than another product, which might infer a higher quality, because a consumer might think that other consumers buy highest quality too. Therefore, in this research, availability of a product will be used as a marketing strategy. Formalized,

H1: When suboptimal fruits and vegetables are presented as scarce, consumers will experience higher quality perceptions of suboptimal fruits and vegetables compared to not being presented as scarce.

2.4 Quality perceptions on purchase intentions

Purchase intentions are formed under the assumption of a pending transaction and, consequently, often are considered an important indicator of actual purchase (Chang & Wildt, 1994). As purchase intention is an important indicator of actual purchase, this purchase intention should be driven in order to diminish the problem of an oversupply of suboptimal fruits and vegetables. According to Chang & Wildt (1994), quality perception has a positive influence on purchase intention. As stated before quality assessments are based on different cues. If, for example, a product has a high price, this external cue might infer a higher quality. A high quality assessment is expected to influence consumers' purchasing behaviour in a

positive way (Grunert, 2005; Zeithaml, 1988). Therefore, if suboptimal fruits and vegetables are perceived to be of a higher quality than optimal fruits and vegetables, consumers will have a higher purchase intention for suboptimal fruits and vegetables. The following hypothesis is conducted:

H2: A higher quality perception of suboptimal fruits and vegetables will lead to a higher purchase intention of suboptimal fruits and vegetables.

2.5 Price effect on quality perception

Research on price effect in the domain of suboptimal fruits and vegetables is scarce.

However, some theories on the positive effect of price on purchase intention are also present, but not tested on suboptimal fruits and vegetables. The price of a product is perceived to have a positive influence on the quality perception of a product (Chang & Wildt, 1994). Next to that price influences perceived quality (Chang & Wildt, 1994), Zeithaml (1988) argues that price also influences the perceived sacrifice, both influencing purchase intentions. Perceived sacrifice is perceived to be that what is given up to obtain a product. Perceived sacrifice is constituted by two parts, perceived monetary value and perceived nonmonetary price (Zeithaml, 1988). Perceived monetary value is the value assigned to the objective price, which, in order to be economically viable for producers, has to be higher for suboptimal fruits and vegetables than for optimal fruits and vegetables. Perceived nonmonetary price is the value assigned to the effort it takes to buy a product (Zeithaml, 1998), but might also be the value of saving the environment, which might be an important reason for buyers of suboptimal fruits and vegetables to waste less food. The value of saving the environment might compensate for the higher objective price, which therefore, might influence quality perception in a positive way. The positive effect of price on purchase intention is, in this research, referred to as price effect. Because price is an extrinsic cue that might influence the

quality perception of suboptimal fruits and vegetables in a positive way because of the price effect, the following hypothesis is conducted,

H3: When suboptimal fruits and vegetables are presented at higher prices than optimal fruits and vegetables, consumers will experience higher quality perceptions of suboptimal fruits and vegetables.

2.6 Interaction effect on quality perception

Both scarcity effect and price effect are, in this research, perceived to have a positive influence on the quality perception of suboptimal fruits and vegetables. Therefore, it is expected that when these two effects are taken together (interaction effect), the total effect will have a bigger effect than the separate effects of price and scarcity. A customer assesses a products' quality based on different cues. Both price and scarcity are cues which are perceived to tell something about the quality of a product. If both these cues tell that a product is of a higher quality than another product, the perception that a product is of a higher quality becomes more salient. Therefore, the following hypotheses are conducted:

H4a: When suboptimal fruits and vegetables are presented as both scarce and at a higher price as fruits and vegetables, consumers will experience higher quality perceptions of suboptimal fruits and vegetables compared to not being presented as scarce and at a higher price than optimal fruits and vegetables.

H4b: When suboptimal fruits and vegetables are presented as both scarce and at a higher price as fruits and vegetables, consumers will experience higher quality perceptions of suboptimal fruits and vegetables compared to the separate effect of scarcity.

H4c: When suboptimal fruits and vegetables are presented as both scarce and at a higher price as fruits and vegetables, consumers will experience higher quality perceptions of suboptimal fruits and vegetables compared to the separate effect of a higher price.

3 Method

Two hundred and thirteen respondents (33% men, 67% women, mean age = 26.3, SD age = 12.48) filled out the questionnaire. Respondents were acquired via the social network of the researcher. Respondents were invited to fill out the questionnaire via different social media. 90 respondents received an invitation via Whatsapp, the other respondents were acquired by an invitation on Facebook. This invitation was shared in different groups: the social network of the researcher, 'Wageningen Student Plaza' (a group for all students to help out each other) and 'BBC 2015-2016' (class of 2015-2016 of Bachelor Business and Consumer Studies students). The respondents would fill out the survey voluntarily.

Qualtrics would randomly assign respondents to one of the conditions of a 2 (Scarcity: No vs. Yes) x 2 (Price: No-Increase vs. Increase) between subjects design with purchase intention as dependent variable.

3.1 Procedure & variables

When respondents used the link in the invitation for the survey, they would be redirected to the survey. Here, respondents would be welcomed to the survey and were told what the purpose of the research was. Next to that, respondents were told that, in the survey, a situation would be outlined where they would be asked how they would act. Respondents were also told that the responses were anonymously recorded and only used in this survey and the survey would only take a few minutes. On the next screen, respondents were asked for their age and gender. After this, respondents were asked to imagine going to the supermarket, and one of the products they would have to buy would be apples. The respondents were told that when they would walk into the supermarket they would see shelves with two types of apples. Here the respondents were told that they would have to choose which apple they would buy,

after this question they would be asked to respond to a few questions about the shown products.

In the following screen, respondents with the manipulation of scarcity applied would see shelves with two types of apples. On the left side, optimal apples were perfectly stacked, while on the right side respondents would see suboptimal apples, with the shelves only half filled. Underneath the shelves, on the right side, respondents would see a slogan which said: “Many customers bought these apples before you, only a few of these apples are left for sale!” (in Dutch: “Vele klanten waren u voor , slecht nog enkele van deze appels te gaan!”). Without the manipulation of scarcity applied, the right side of the shelves would be perfectly stacked as well, but without a slogan applied.

Respondents with the manipulation of price applied would see shelves with two types of apples, on the left side optimal apples priced at €2.00/kilo, while on the right side respondents would see suboptimal apples priced at €2.20/kilo. Without the manipulation of price applied, the suboptimal apples would be priced at €2.00/kilo as well.

With or without the manipulation of price or scarcity, respondents were first asked which of the two types of apples they would buy. This question would measure purchase intention by which respondents could only choose between the two types of apples. Another way of measuring purchase intention would be measured in the following question, where respondents would only see the shelves with suboptimal apples. Here respondents were asked to assess the probability of buying this suboptimal apple on a 9 point Likert scale (Likert, 1932) (1 =Very low probability and 9 = Very high probability). This variable is called Purchase Intention.

In the following screen, respondents were shown the two types of apples again, where they would be asked to rate their quality perception of the suboptimal apple, compared to the

optimal apple. Quality Perception would be measured using the following 6 different items, each rated on a 9 point Likert scale (Likert, 1932):

1. Item Taste: Suboptimal apples have a worse taste compared to optimal apples
(1)...Suboptimal apples have a better taste compared to optimal apples (9)
2. Item Healthy: Suboptimal apples are less healthy compared to optimal apples
(1)...Suboptimal are more healthy compared to optimal apples (9)
3. Item Safety: Suboptimal apples are less safe compared to optimal apples
(1)...Suboptimal apples are more safe compared to optimal apples (9)
4. Item Quality: Suboptimal apples are of a worse quality compared to optimal apples
(1)...Suboptimal apples are of a better quality compared to optimal apples (9)
5. Item Price: Suboptimal apples are too expensive as compared to optimal apples
(1)...Suboptimal apples are too cheap as compared to optimal apples (9)
6. Item Worth Their Money: Suboptimal apples are less worth their money as compared to optimal apples (1)...Suboptimal apples are more worth their money as compared to optimal apples (9)

The items for quality perception were based on the researchers' perception of a good quality assessment. A factor analysis on these 6 quality items was conducted and after this, 2 factors were used for data analysis. The factor Quality Perception (Eigenvalue = 2.32) explained 46% of the variance, but only formed a reliable scale ($\alpha = 0,701$) when the perception of price of the suboptimal apple was left out ($\alpha = 0,625$) (factor loadings with Cronbach's Alpha, both with and without item Price can be found in Appendix 3.1.1). Therefore, the perception of price of the suboptimal apple was analysed separately, which will be referred to as Price Perception.

After these questions, respondents were thanked for their participation, asked if they had any suggestions/questions towards the survey, and they were told they could leave the survey. A full view of the survey is added in Appendix 3.1.2.

4 Results

4.1 Quality Perception

The following predictions were made:

- It was predicted that scarcity would have a positive effect on the quality perception of suboptimal apples compared to when the scarcity condition would not be present.
- It was predicted that price increase would have a positive effect on the quality perception of suboptimal apples compared to when the price increase would not be present.
- It was predicted that the interaction effect of both scarcity and price effect would have a positive effect on quality perception of suboptimal fruits, compared to when these effects would not be present.

A 2 (Price: yes vs. no) x 2 (Scarcity: yes vs. no) between subjects ANOVA with Quality Perception as dependent variable was used to analyse these hypotheses, which did not support all of the hypotheses.

There is a significant main effect of scarcity on quality perception $F(1,208) = 5.28, p = .023$. Respondents that were presented with scarcity ($M= 4.69, SD= 1.02$), had a higher quality perception of suboptimal apples than respondents who were not presented with scarcity ($M= 4.38, SD= 0.939$). However, respondents that were presented with scarcity ($M= 5.72, SD= 1.76$) did not show a significant difference when Price Perception would be used as dependent variable compared to respondents that were not presented with scarcity ($M= 6.07, SD= 1.77$), as this effect was not significant, $F(1,208) = 2.68, p = .103$.

The effect of price on Quality Perception is insignificant $F(1,208) = 0.11, p = .738$.

Respondents that were presented with the price increase ($M= 4.52, SD= .964$) would not have a higher quality perception of suboptimal apples than respondents not in the price increase condition ($M= 4.55, SD= 1.018$). However, respondents in the price increase condition ($M=$

6.33, SD= 1.76), do have a higher Price Perception of suboptimal apples, as these are too expensive as compared to optimal apples, than respondents that were not presented with the price increase (M= 5.47, SD= 1.68), $F(1,208) = 13.74, p < .001$.

There is not a significant main effect of the interaction effect (both scarcity and price increase) on quality perception $F(1,208) = 0.33, p = .569$. Respondents in both the scarcity- and price increase condition (M= 4.63, SD= .885) did not have a significant higher quality perception of suboptimal apples than respondents not being in this condition (M= 4.50, SD= 1.01), $F(1,208) = 0.05, p = .824$. Next to that, respondents that were presented with both scarcity and price increase (M= 6.17, SD= 1.74), did not show a significant effect on Price Perception of suboptimal apples as compared to respondents that were not presented with both scarcity- and price increase (M= 5.81, SD= 1.71).

4.2 Purchase Choice

It was predicted that scarcity would have a positive effect on the Purchase Choice of suboptimal apples compared to when the scarcity condition would not be present. Because Purchase Choice was an ordinal variable (respondents could only choose between one of the two apples), a crosstabulation was conducted. In this crosstabulation scarcity effect was placed in the first layer, price effect in the second layer and Purchase Choice was placed as column. This crosstabulation did not fully support the hypotheses. In case that price increase would not be applied, there would not be significant difference between respondents with- (12.0% choose suboptimal apples) and without (7.1% choose suboptimal apples) the scarcity effect applied ($\chi^2(1) = 0.73, p = .393$), with 1 cell (25%) with an expected count less than 5. In case that price of suboptimal apples would be increased, a marginally significant difference was seen between respondents with- (5.6% choose suboptimal apples) and without (0.0% choose suboptimal apples) the scarcity effect applied ($\chi^2(1) = 2.97, p = .085$), with 2 cells

(50%) with an expected count less than 5. (For a full overview of respondents that choose (sub)optimal apples see Appendix 4.2.1.)

Next to that, it was predicted that a price increase would have a positive effect on the Purchase Choice of suboptimal apples compared to when the price increase would not be present. For this analysis, a crosstabulation was conducted with price effect placed in the first layer, scarcity effect in the second layer and Purchase Choice placed as column. This crosstabulation did not fully support the hypotheses either. In case that scarcity would not be present, a marginally significant difference was seen between respondents presented with a price increase (0.0% choose suboptimal apples) and the respondents not presented with a price increase (7.1% choose suboptimal apples) ($\chi^2(1) = 3.86$ $p = .050$) with 2 cells (50%) with an expected count less than 5. In the case that scarcity would be present, there would not be a significant difference between respondents presented with a price increase (5.6% choose suboptimal apples) and respondents not presented with a price increase (12.0% choose suboptimal apples) ($\chi^2(1) = 1.36$ $p = .243$), with 2 cells (50%) with an expected count less than 5. (For a full overview of respondents that choose (sub)optimal apples see Appendix 4.2.2.) Thus, respondents that were presented with a higher price would choose suboptimal apples more often than respondents that were not presented with a higher price.

4.3 Purchase Intention

The following predictions were made:

- It was predicted that scarcity would have a positive effect on the Purchase Intention of suboptimal apples compared to when scarcity would not be present.

- It was predicted that a price increase would have a positive effect on the purchase intention of suboptimal apples compared to when the price increase would not be present.

A 2 (Price: yes vs. no) x 2 (Scarcity: yes vs. no) between subjects ANOVA with Purchase Intention as dependent variable was used to analyse these hypotheses, which did not support all of the hypotheses.

For the effect of scarcity a significant main effect on Purchase Intention isn't seen, $F(1, 208) = 0.86$, $p = .354$. So respondents' purchase intention for suboptimal apples would not differ between being presented with scarcity ($M= 4.09$, $SD= 2.11$) and not being presented with scarcity ($M= 3.85$, $SD= 2.06$).

For the effect of price a significant main effect on Purchase Intention was seen, $F(1, 208) = 6.85$, $p = .01$. Respondents that were presented with a higher price ($M= 3.6$, $SD= 1.98$) for suboptimal apples would show a lower purchase intention than respondents not being presented with a higher price ($M= 4.33$, $SD= 2.13$) for suboptimal apples.

4.4 Mediation analysis

It was predicted that quality perception would have a positive effect on purchase intention. In order to test this assumption a linear regression with price effect, scarcity effect and the interaction effect of these variables (Price*Scarcity effect) as independent variables and Purchase Intention as dependent variable was conducted. This test was conducted in order to see if there would be a main effect of one of the independent variables on Purchase Intention. Which was only the case for price effect ($\beta = -0.73$, $t(208) = -2.61$, $p = .01$), but only if Price*Scarcity effect would be left out. For scarcity the effect on Purchase intention was insignificant ($\beta = 0.26$, $t(208) = 0.93$, $p = .354$).

In order to see whether the effect of price on Purchase Intention would be mediated by Quality Perception, another linear regression was conducted. The reason why a linear regression is used for the mediation analysis is because Quality Perception is an ordinal scale, which can't be used as independent variable in ANOVA's. Price- and scarcity effect were put in layer one, Quality Perception would be put in layer two and Purchase Intention would be used as dependent variable. The hypothesis is only partly significant. A significant effect of Quality Perception on Purchase Intention is seen ($\beta = 0.527$, $t(208) = 3.75$, $p < .001$). However, the effect of price is not mediated by Quality Perception, as the significance of this effect did not change ($\beta = -0.71$, $t(208) = -2.60$, $p = .01$). Thus, Quality Perception does have an effect on Purchase Intention, but it does not mediate the effect of price.

5 General discussion

In previous studies, little research has been done on the effect of price and scarcity on quality perception and purchase intentions of consumers, concerning suboptimal fruits and vegetables. The present research is trying to fill this knowledge gap by looking at suboptimal apples. It appears that the price/kilo of suboptimal fruits and vegetables has a negative effect on the purchase intentions, which is the opposite of what was expected. The reason for this might be that consumers do not see price as a quality cue, but more as a sacrifice (Zeithaml, 1988). This sacrifice would not be compensated by a good feeling of being environmental friendly, which, therefore, has a negative influence on purchase intention.

Scarcity incentives of suboptimal fruits and vegetables seem to have effect on the quality perception of these products. However, the higher quality perception, because of the effect of scarcity, is not working through to the purchase intention of these apples. It appears that purchase intentions for suboptimal apples can only be increased by decreasing the price of these products, quality perception seems not to mediate in determining purchase intention.

5.1 Theoretical and practical contributions

This research answers questions on how consumers perceive the quality of suboptimal products, and next to that, assesses purchase intention for these products. This insight is extended to whether this quality perception can be changed by external cues: the effect of a price increase of suboptimal apples and the effect of scarcity cues are tested in an online survey. In this survey, consumers were put in a situation where they had to decide between buying optimal or suboptimal fruits, in order to assess their purchase intention. Next to that, consumers were asked to assess their purchase intention and the quality perception of suboptimal fruits. In these situations, cues of price and scarcity were added to see whether these manipulate the purchase intention and quality perception.

The present findings provide an important contribution to research on consumer behaviour regarding food waste. Theories on how purchase intention for suboptimal fruits and vegetables is influenced is scarce. Because little research is done on this subject, this research tries to create the first insights in how consumer behaviour works, when it comes to buying behaviour of products that are easily discarded. Next to that, first steps are made with trying to influence consumers in their quality perception and purchase intention. Creating higher quality perceptions and purchase intentions for products that are easily discarded by supermarkets and consumers, leads to a higher demand for these products. Therefore, this research contributes to literature that might help reduce food waste.

Research from other areas on consumer behaviour is not yet confirmed to work for suboptimal products. The positive effect of price on purchase intention for suboptimal products, as suggested by Chang & Wildt (1994), was not found. In fact, a negative effect of price on purchase intention on suboptimal apples was found. This might be caused by suboptimal apples being another category of products with which this is tested. It is possible that consumers see suboptimal products differently, as compared to the ones tested by Chang & Wildt (1994), which may lead consumers to act different.

In this research, scarcity has proven to influence the quality perception of suboptimal fruits and vegetables. However, scarcity, as external cue, influencing quality perceptions has not been covered in present literature, such as theories on cue utilization (Zeithaml, 1988). Which is peculiar, because this effect could not only be of influence on suboptimal fruits and vegetables, but also on other food products, or even non-food products. For example: when a consumer is in a store, buying a new laptop, there is a big assortment of different types of laptops. If the consumer has not much knowledge about laptops, a cue for what is a good laptop might be what other consumers bought, so if there is only one laptop left of a certain type, this laptop might be perceived to be of a better quality. So, next to whether scarcity has

influence on other products, the underlying reasons why scarcity might be a good quality cue is also not yet explored, giving space for future research.

This research contributes to insights in consumers' intentions concerning purchase intentions for suboptimal fruits and vegetables. It can be concluded that there is a negative effect of price, and a positive effect of quality perception on these intentions. However, what is not yet clear, is whether consumers' intentions are also integrated into their behaviour. Because consumers' intentions are not always a guarantee for how consumers will act, in other words, intentions are something different than 'behaviour' (Ajzen & Fishbein, 1988). The difference between consumers' intention and their actual behaviour is described by Fishbein (2002), as the intention-behaviour gap. Consumers might act different in a survey than in the supermarket and therefore more research could be done on this part of consumer behaviour concerning suboptimal fruits and vegetables.

Next to a theoretical contribution, this research also has practical relevance. Marketers can use the knowledge on scarcity, as scarcity cues show a positive relation with quality perception of suboptimal fruits and vegetables. However, marketers should keep in mind that the positive effect on the quality perception does not have an effect on the purchase intention for these products. So marketers can use scarcity to influence the quality perception of suboptimal products, but this will not affect the purchase intention. Next to that, using scarcity as a way of increasing quality perception might not fit in with supermarkets' policies, as, in general, shelves need to be filled most of the time. Possible reasons for this are that consumers argue that unfilled shelves look disorganized, or it might infer that the supermarket is incapable of estimating stocks properly, leading to consumers judging the specific supermarket as dissatisfactory.

Besides, now marketers know that they can't use a higher price for suboptimal fruits and vegetables than for optimal fruits and vegetables. Using a higher price for suboptimal fruits

and vegetables is not a viable option, as this is not going to lead to more sales. However, in order to sell more suboptimal fruits and vegetables, marketers can try to sell suboptimal fruits and vegetables together with optimal fruits and vegetables. This is a feasible solution, as the quality perceptions of suboptimal fruits and vegetables ($M= 4.53$, $SD= 0.99$) do not differ from optimal ones, $t(213)= 0.46$ $p= .647$. Now that marketers know this, marketers could treat suboptimal fruits and vegetables just the same as optimal fruits and vegetables, since consumers do not differ between quality perceptions of suboptimal and optimal fruits and vegetables.

5.2 Limitations & future research

One of the limitations of this research is that it is only conducted in the Netherlands, and it may therefore only be applicable to this country. As countries in Europe differ in their values concerning food consumption (De Maya et al., 2011). Dutch consumers' might therefore act different towards suboptimal fruits and vegetables, compared to other European countries. In order to get more insight into whether suboptimal product wastage in other European countries, or even other parts of the world is a problem and if so, how consumers behave towards these products, future research on this should be done there.

Next to this, the effect of price increase on Purchase Choice would only be marginally significant. This means that even though it is close to significant, it is difficult to make harsh statements about this. Before anything would be done with these effects, future research should be done on whether or not this effect is really significant.

5.3 Conclusion

Because of its great welfare, developed countries have to deal with luxurious problems, such as food waste. Some parts of food is wasted because it does not comply with high quality standards set by retailers. However it seems to be not true that consumers do not want these

products. Because consumers seem to be indifferent about how they perceive the quality of fruits and vegetables when assessing their purchase intention for these products. It seems that the main factor in assessing the purchase intention of fruits and vegetables is price. Reducing the price of these suboptimal fruits and vegetables would be one option to increase purchase intention for suboptimal fruits and vegetables. But, what is far more interesting is that consumers do not differ in quality perceptions between suboptimal and optimal fruits and vegetables. Supermarkets should just sell suboptimal and optimal together, solving the problem of separately transported suboptimal fruits and vegetables, getting rid of suboptimal products. Besides, we could maybe get rid of the whole concept of 'suboptimality', as consumers seem not to differ between the colour and shape of fruits and vegetables.

Appendix

	First Solution	Final Scale
Item	Factor loading	Factor loading
Suboptimal apples have a worse / better taste	.705	.703
Suboptimal apples are less / more healthy	.235	.582
Suboptimal apples are less / more safe	.555	.751
Suboptimal apples are of worse / better quality	.865	.764
Suboptimal apples are too expensive / too cheap	-.257	-
Suboptimal apples are (not) worth their money	.659	.581
Cronbach's Alpha	.625	.701

Appendix 3.1.1: Factor loadings and Cronbach's Alpha for Quality Perception



WAGENINGEN UR
For quality of life

Welkom bij dit onderzoek

Bedankt dat u mee wilt werken aan dit onderzoek! In dit onderzoek wordt gekeken naar het koopgedrag van consumenten in de supermarkt. In de komende vragen wordt een situatie geschetst waarbij u wordt gevraagd hoe u over deze situatie denkt. U wordt hierbij gevraagd om zo oprecht mogelijk antwoord te geven: ik ben alleen geïnteresseerd in uw mening. Uw antwoorden zullen volledig anoniem zijn en alleen voor dit onderzoek gebruikt worden. Dit onderzoek neemt slechts een paar minuten in beslag.

Ik ben een:

Man

Vrouw

Wat is uw leeftijd (in jaren)? Ik ben....jaar

Situatieschets:
Beeld u zich sub in dat u in de supermarkt bent om onder andere appels te kopen. Wanneer u bij het schap van de appels komt, ziet u dat er de keuze is tussen twee verschillende appels. U zult gevraagd worden welke van de appels u koopt. Nadat u uw keuze heeft gemaakt volgen een aantal vragen over de producten die u gezien heeft.

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Hieronder ziet u de twee soorten appels die u kunt kopen in de supermarkt. Welke appels zou u waarschijnlijk kopen? Klik aub op uw keuze.





Wanneer u de kwaliteit van beide appels met elkaar vergelijkt wat denkt u dan van de appels in het rechter schap? De appels in het rechter schap...

hebben een slechtere smaak	<input type="radio"/>	hebben een betere smaak
zijn minder gezond	<input type="radio"/>	zijn gezonder
zijn minder veilig	<input type="radio"/>	zijn veiliger
zijn van mindere kwaliteit	<input type="radio"/>	zijn van betere kwaliteit
zijn te goedkoop	<input type="radio"/>	zijn te duur
zijn hun geld niet waard	<input type="radio"/>	zijn hun geld zeker waard

Bedankt voor uw deelname aan dit onderzoek!

Indien u nog vragen of opmerkingen hebt over dit onderzoek, dan kunt u deze hieronder invullen.

Voor vragen of opmerkingen over dit onderzoek kunt u ook contact opnemen met Rob van der Burg via het volgende e-mail adres: rob.vanderburg@wur.nl
Bedankt voor uw tijd!

Bedankt voor uw tijd om aan deze enquête deel te nemen.
Uw antwoord is geregistreerd.

Appendix 3.1.2: Example of the survey for respondents in both scarcity- and price condition.

		Choice between two types of apples		
Price effect applied	Scarcity effect applied	Optimal	Suboptimal	Total
No	Yes	88.0%	12.0%	23.6%
	No	92.9%	7.1%	26.4%
	Total	90.6%	9.4%	50.0%
Yes	Yes	94.4%	5.6%	25.5%
	No	100.0%	0.0%	24.5%
	Total	97.2%	2.8%	50.0%
Total	Yes	91.3%	8.7%	49.1%
	No	96.3%	3.7%	50.9%
	Total	93.9%	6.1%	100.0%

Appendix 4.2.1: Respondents' choice for optimal/suboptimal apples, with price effect in the first layer and scarcity effect in the second layer.

		Choice between two types of apples		
Scarcity effect applied	Price effect applied	Optimal	Suboptimal	Total
No	Yes	100.0%	0.0%	24.5%
	No	92.9%	7.1%	26.4%
	Total	96.3%	3.7%	50.9%
Yes	Yes	94.4%	5.6%	25.5%
	No	88.0%	12.0%	23.6%
	Total	91.3%	8.7%	49.1%
Total	Yes	97.2%	2.8%	50.0%
	No	90.6%	9.4%	50.0%
	Total	93.9%	6.1%	100.0%

Appendix 4.2.2: Respondents' choice for optimal/suboptimal apples, with scarcity effect in the first layer and price effect in the second layer.

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