

# *The Impact of fluctuating quality*



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## Acknowledgment

This thesis is the final part of my master Management and Economics, specialization Marketing and Consumer behavior (A4). Quality is in my eyes the most important part of a product. Offering sufficient quality should ensure a steady stream of consumers, provided that the products fit the market preferences. I find it therefore very interesting to take a closer look into the effect of fluctuating quality. And I really enjoyed working on the subject.

Different people supported me during the thesis. I am grateful for that. Special thanks to Frans Verhees who helped me during the process by giving support and feedback. Besides Frans I would like to thank my family and friends which helped me during the research and supported me during the process.

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## Executive Summary

Constant product quality has a significant impact on consumer satisfaction and the buying intention of consumers. However with a seasonal and perishable fresh food product like an apple, this constant quality demand is very hard or even impossible to fulfil. Apples are harvested in September and stored in a cooled storage through the rest of the year. The quality of the stored apples slowly diminishes in time after harvest. Apple firms tackle the diminishing quality in three different ways: 1) Stop selling the apples after 6-8 months. 2) Start importing apples after 6-8 months. 3) Do not take action and sell the same apples from September till end of August. It is not known what the best tactic is, therefore this research investigates what the influence is of fluctuating quality upon buying intention and satisfaction throughout the year.

A theoretical model is constructed and is tested by a longitudinal experiment. The model is based upon two pillars. The first pillar describes how consumers determine quality during the purchasing phase based on cues. Cues which consumers use to determine the quality of an apple before consumption are; Aroma, Colour, Shape, Size, Brand, Knowledge and Touch/Feeling. Consumers use these cues, without actually tasting the apple, to determine and predict the flavour and texture of the apple. By determining the texture and taste of the apple consumers try to find the best fit(s) to their preference(s). The second pillar describes how consumers perceive quality while consuming the apple. If the perceived quality of the product attributes of the apple is better than the expected quality of the product attributes of the apple the consumer will be satisfied or vice versa. Automatically linked to satisfaction is the likability consumers would buy the apple.

To test the model a longitudinal experimental design was constructed which is able to measure expected and perceived quality, satisfaction and buying intention throughout time. In total 125 respondents judged 6 apples. First the respondents needed to determine the quality of the product attributes of the apple by just following the cues given by the apple and without tasting the apple. Following to this the consumers needed to indicate how satisfied they were with the apple and how big the chance is they would buy the apple within two weeks. Secondly the consumers were asked to taste the apple and to actual perceive the quality of the product attributes of the apple. After consuming the apple and judging the quality of the product attributes of the apple again the level of satisfaction was questioned and the intention to buy the apple within two weeks. The process is repeated until the respondent judged each single apple of the research. The first measurement was conducted in May and was conducted among 58 respondents. The second measurement was conducted in September and was conducted among 67 respondents.

A general linear model test is used to analyse if the respondents expect and perceive differences in apple quality throughout the year. The results indicate that apple quality and tastiness of an apple is based upon the juiciness, corniness (mealy), hardness and crunchiness of an apple. The harder the apple, the better quality perception, besides to the preferences in flavour of course. However, a harder apple does not automatically imply a higher chance to be bought, it is based upon familiarity. E.g. the more familiar Elstar and Jonagold do have a higher chance to be bought compared to the harder apples Kanzi or Pink Lady. The data also indicate that consumers, based on the provide cues, do change their expectations about the quality of the products attributes of the apple throughout time. However, consumers do not “really” have an idea what is changing. The consumers expected the apple becomes sweeter, fresher and softer through time, but the overall tastiness stays the

same. The results suggest that consumers do not know that apples are freshly harvested in September and the rest of the year, if not imported, are sold from a cooled storage.

When tasting the apple respondents did notice a difference in quality of the product attributes of the apples. The apples in May were perceived as softer, less juicy, less crunchy, mealier and overall less tastier than freshly harvest apples in September. The result correlates with the decline in buying intention in time after harvest. The overall satisfaction on the other hand did not show any differences. An odd result, if the perceived quality does not meet the expected quality, the satisfaction should drop. The mismatch is assumable a measurement error and is explained in the discussion.

The results of the research have indicated that the perceived quality of the product attributes of the apple is declining in time after harvest. Unfortunately, based on the obtained data it is not able to determine what the best tactic is to use for apple companies. Because both measurements in this research included all the apples. Therefore it is unknown what the effect is of not selling an apple for 4-6 months. This should be further research by obtaining more data on different moments in time after harvest, especially in the month July until August.

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# Chapter 1 Introduction

## 1.1 Introduction

Constant product quality has a significant impact on consumer satisfaction and buying intention of the consumer; (Alvensleben et al,1997, Tsiotsou 2005, Kotler, et al.2010). However with a seasonal and perishable fresh food product like an apple, this constant quality demand is very hard or even impossible to fulfil (Dijk 2014). Due to the harvest time, apple growers are not able to deliver the same constant quality throughout the year. The intrinsic quality attributes of the apples are excellent in September, but the same intrinsic quality attributes of a 1 year old apple are rather poor in August (Riezebos et al., 2005). Consumers use intrinsic cues and extrinsic cues to determine the quality of the intrinsic attributes. Intrinsic cues are defined as *cues which cannot be changed without changing the physical composition of the product, examples of intrinsic cues are smell, flavour, colour, shape and size* (Hausen 2005). Cues which are changeable without changing the physical composition of the product are extrinsic cues (Olson 1972). Which is defined as *cues external to the product such as price, store image, or brand* (Teas et al.2000). Both intrinsic and extrinsic cues serve to influence the consumer's perception of a product's quality.

'The *comparative Advantage Theory of Competition*' explains how a comparative advantage leads to a competitive advantage and eventually financial performance (Hunt, et al. 1995). The comparative advantage is based on resources. Examples of resources are low production costs, access to high quality ingredients etc. The comparative advantage influences the competitive advantage, in other words the market positioning. If a company has a comparative resource, e.g. low production costs, the company can position itself as cheaper than the competitors. This positioning creates a unique market position which attracts consumers. Another example of a resource which leads to a unique market positioning is unique ingredients or raw materials. Take e.g. a company which has the same price as competitors but a higher quality due to the unique raw materials, the quality is therefore a unique selling point. The unique selling points attract consumers and should eventually result in more revenue (Hunt, et al. 1995). The competitive example, or also known as 'market positioning' is defined as; 'The customer's perceptions of a product or brand in a market Segment (AMA. 2014). In other words, the position which a brand/product has in a consumer's mind. The position of a brand in the mind of consumers is based upon extrinsic and intrinsic cues. For a firm it is important to keep the cues stable. Stable cues are able to create a stable positioning in the mind of consumers and therefore a stable buying intention and stable consumer satisfaction (Giese et al.2000).

By apples it is easy to keep the external cues constant through the year, but the intrinsic quality cues will slowly diminish through time (Riezebos et al. 2005). And because consumer cannot yet taste the intrinsic quality attributes in the purchasing phase, the consumer determines his/her product choice upon the cues and earlier experience with the apple. However, this could lead to wrong expectations, especially later in time after harvest. Although apple firms know their intrinsic quality attributes are diminishing, the firms keep positioning the apple equally through the year. It can even be that the intrinsic cues still look fresh after 8 months but the intrinsic quality attributes are of another (poor) quality (Riezebos et al. 2005). However, because the cues are the same, the consumer automatically expects that intrinsic quality attributes of the apple will be equal in September as in June. Not fulfilling the quality expectation will disappoint the consumer and will affect the loyalty and re-purchase behaviour of the consumer.

Apple firms try to tackle the diminishing quality three different ways:

1. Kanzi, Junami, Ruben, Greenstar, Delcorf, etc. stop selling apples after 8 months because the quality is too poor.
2. Royal Gala, Granny Smith, Breaburn, Pink Lady, etc. start importing apples after 8 months to keep the quality 'stable'.
3. Jonagold, Fuji, Golden delicious, Red Prince, Elstar, etc. keep selling the apples after 8 months with declining quality.

Unfortunately no research is found what the best strategy is to follow. Therefore this research investigates what the influence is of fluctuating quality upon buying intention and satisfaction in time after harvest.

## 1.2 Definition of the problem

The apple quality of apples is not the same through the entire year. The apples which are sold in September are freshly harvested and in August the apples have spent 11 months in a cooled storage. Until now it is not clear what the impact is of the fluctuating apple quality upon the positioning and buying intention of brands. To gain more knowledge about its impact this research will be conducted and therefore the following general research question is constructed:

*“What is the impact of the fluctuating apple quality throughout the year upon the positioning and buy intentions of apple brands?”*

## Chapter 2 Literature study

It is important to know how consumers perceive quality and why consumers (re-)buy products. Different consumers have different preferences. Different preferences demand different products to satisfy the different consumer preferences. When standing for a shelf consumers can choose a huge variety of products to fulfil their preferences. Therefore it is important to know what 'quality' actually is. How consumers perceive quality. What the influence of quality is on loyalty. The following literature study helps to explain the factors and develop a model, which can be found in figure 1.

In the first Section the definition of "quality" will be determined. In the second Section four approaches will be discussed to gain a better understanding in how consumers perceive quality. In the third Section will be discussed how consumers create expectations about the quality of apples. In the fourth Section will be described how consumers perceive quality. In the last Section the impact of consumer loyalty will be discussed.

### 2.1 The definition of quality

Quality is an overarching term which can be interpreted in two broad terms: 'food safety' (Grunert 2005) and 'food quality' (Juran et al. 1974, Selnes 1993). Because this research is focussing on the expected and perceived quality of apples, in the eyes of the consumers, and not on food safety, the definitions of food safety are not taken into account. The broad definition of consumer quality is '*Fitness for intended use*' (Juran et al. 1974). However, this definition is rather broad when discussing the definition of food quality. Therefore another and more specific definition is used. '*Quality is the index that reflects the extent to which the customer feels that his need, the product, and his preferences & perceptions for that product overlap.*' (Thurstone 1985, Steenkamp 1987). The same definition is used for product quality and perceived quality because the terms are interchangeable with the term 'quality' (Steenkamp 1987). Although this definition is clearer, it is still too broad, because this research is looking at the corner stones of quality. Each box in the theoretical model represents a cornerstone of quality. In other words, all the boxes, which represent all corner stones in quality, together form "quality". So, although quality is not specifically mentioned in one corner stone of the theoretical model, quality is present in every corner stone. When taking a closer look into quality, consumers use cues to 'access' quality before prior consumption. The actual product attributes are only available during consumption. Therefore a cue is defined as '*informational stimuli that are, according to the consumer, related to the quality of the product, and can be ascertained by the consumer through the senses prior to consumption*' (Steenkamp 1987). Product attributes are defined as '*The functional and psychosocial benefits provided by the product. Attributes represent what the product is perceived as doing or providing for the consumer. Quality attributes are unobservable prior to consumption.*' (Steenkamp 1987) Thus cues, like colour, aroma, and touch are used to predict the quality of product attributes and therefore product quality. If the perceived product attributes are equal or better than expected quality of the product attributes of the apple, the consumer is more satisfied. Therewith the chance of re-buying the product and loyalty to the product grows (Giese et al. 2000, Riezebos et al. 2005).

### 2.2 Food quality perception models and theory

There are four main research approaches to understand consumer perception of food quality (Hausen 2005). The first approach is the "*economics of information*" approach to explain perception of quality. This theory splits product attributes into search, experience attributes and credence attributes (Becker 2000, Hausen 2005). Search attributes are attributes which consumers can

evaluate, by doing just a simple inspection, before doing the actual purchase (Ophuis, et al. 1995, Becker 2000). These search attributes are very important for the quality selection process of consumers and are based upon the visible cues and touchable product attributes of the apple. Examples of search attributes are colour, brand, shape and size (Becker 2000). Experience quality attributes are attributes which consumers can only evaluate by consuming the actual product (Ophuis, et al. 1995, Becker 2000). Examples of experience attributes are flavour and texture. The experience attributes on their turn are used as valuable input for a brand and potential repeat purchases in the future (Becker 2000). In this research the experience attributes are used to confirm or disconfirm the expected intrinsic quality of the product attributes of the apple(s). Credence quality are product attributes which are not available or accessible during the buying or consuming process. Credence attributes are attributes on which consumers must rely, for instance the origin of the product or the usage of antibiotics, those attributes cannot be tested and a consumer must simply rely on the information given by the producer. Though the credence attributes still have an impact on the quality perception of consumers and must be taken into account.

The second approach is the *multi-attribute* approach. The model specifies three elements; 1)Attributes, 2)Beliefs, 3)Importance (Solomon et al. 2006). In this approach is assumed that the attitude of a consumer towards an object will depend on the beliefs the consumer has about one or several attributes of the object. And that the consumers has weighted the attributes with a level of importance given by the consumer itself. E.g. when measuring texture of an apple, it can be split into e.g. the attributes "juiciness", "corniness" and "hardness". The attributes are scored by the consumer and then multiplied with the level of importance, rated by the consumers themselves to create an overall attitude towards the texture of that particular apple. Although this approach is used by uncountable studies there are some drawbacks. First of all, possible relationships and interference between attributes are not taken into account. Secondly, the approach does not make a distinction between search, experience and credence attributes (Hausen 2005). Despite the drawbacks the *multi-attribute* approach will still be used to determine which specific attributes are influencing the quality perception of the apple(s) and therefore the total satisfaction and buying intention of the apple(s).

The third approach is the *cue utilization* approach of Easterbrook. Because a consumer receives too much stimuli to process, the cue utilization theory assumes consumers are narrowing down the stimuli to the most useful cues to make their decision. Thus when a consumer is 'perceiving' quality of a product, the consumer will start looking and selecting the most useful cues on the spot. Thereon the consumer starts evaluating the cues to create an overall quality perception about the product (Olson 1972, Hausen 2005). Examples of cues which consumers use to evaluate the quality of the product are, Brand name, Store name and Market share (Hausen 2005). Because this research is purely focussing on apple quality this approach will not be taken into account. In this research consumers only need to focuses on a limited amount of quality cues provided by the apple itself. Extra cues like store name, market share, peers, positioning of the apple in the shelve etc. will not be included in this research.

The fourth approach is the hierarchical approach and means-end chain theory. This approach links product attributes and product cues to higher and more abstract levels/values which are important for a consumer (Gutman 1982, Zeithaml 1988, Hausen 2005). For example a product label (cue)

indicates that an apple is grown without the uses of pesticides. "Free of pesticides" could be linked by a consumer to a higher level like healthiness, and healthiness could be linked to healthy life. In this example the information about "not using pesticides" on the label is the product cue which implies a "healthier" product which is helpful for a "healthy life". And a healthy life is the value which is very important for the consumer. Because the process of the means-end and the hierarchical approach theory is unique for every consumer, the analyses are very time consuming and will not be used in this research. But it could be used in further research.

## **2.3 Determining quality before consuming the apple**

Now it is clear how consumers perceive quality, it is important to take a closer look to the cues which consumers use to create an expectation about the quality of the product attributes of an apple. During the pre-purchase phase those cues are based on what a consumer sees, touches and smells. Based on these senses consumers must decide which product is the best choice to fulfil the need. In the first subsection the influence of sight will be discussed. In the second subsection the influence of smell will be discussed. In the last subsection the influence of touch will be discussed.

### **2.3.1 The influence of sight on quality expectations**

One of the sense organs which consumers use is Sight. Sight is an important factor during pre-purchase phase. Sight includes cues like colour, brand, size and shape (Gamble et al. 2006). Those cues could be either intrinsic or extrinsic. In the first sub-subsection the influence of colour will be discussed. In the second sub-subsection the influence of the shape and size of an apple. In the third sub-subsection the influence of a brand will be discussed.

#### **2.3.1.1 The influence of Colour on quality expectations**

One of the cues which influence consumer during pre-purchase is the intrinsic product attribute colour. Colour is a very important cue of food products, because it influences the first judgement of consumers. Colour is used by consumers to predict the flavour and texture of the product (Dubose, Dubose et al. 1980, Delwiche 2003). For example a red coloured apple is perceived as more sweet, a green apple as more fresh and a yellow apple as more sour (Delwiche 2003). The greener the fruit, the more freshness it is perceived, the more red the more mature. Brown spots are a cue for possible rotten pulp under the peel and therefore a bad texture of the apple. All those colours have a huge impact before the actual consumption takes place (Dubose et al. 1980, Delwiche 2003). Not only does colour have a big influence on the choice of which product will be purchased, but also during consumption. More intense colours let consumers perceive more intense flavours and smell during consumption (Zellner et al. 1990, Delwiche 2003).

#### **2.3.1.2 The influence of shape and size on quality expectations**

Colour, shape and size are together forming the appearance of an apple (Gamble, et al. 2006, Rouphaelan et al. 2010). Shape and size are influencing the choice of consumer, but less than colour. So consumers prefer a well-shaped round apple above a misshaped elongate-concave apple (Gamble, et al. 2006), but shape or size do not predict the quality of the product attributes of the apple. Thus, although shape and size do have influences on the appearance of the apple, it especially colour which influence the quality expectation of the apple (Gamble, et al. 2006, Rouphaela et al. 2010).

### **2.3.1.3 The influence of a brand on quality expectations**

A brand is defined as 'A name, term, sign, symbol, design or a combination of them intended to identify the goods or services of one seller, or a group of sellers and to differentiate them from those of competitors (or future competitors)' (Kotler 1999). A brand is an important extrinsic cue for consumers when searching for products to fulfil their need. By apples, companies communicate a brand by putting small stickers on the apple. Not only is the brand logo put on those stickers, but also a few key words to tell the consumer something about the product attributes of the apple like 'Sweet Apple' and 'Crunchy Apple'. But, the words are still a cue, the consumer cannot taste the real product attributes yet and need to trust the information provided by the supplier. Still consumers use these cues to find the best match for their preferences. When seeing a particular brand consumers try to do a brand recall out of mind. Also known as the brand image, which is defined as 'perceptions about a brand as reflected by the brand associations held in consumer memory' (Leone et al. 1993). By doing a recall out of mind consumers try to remember what the brand image is of that particular apple. Brand image is based upon the actual perception which consumers memorize of the brand, based on their earlier experiences, thoughts, feelings and perceptions of the brand (Leone et al. 2006). Consumers use the memory of the brand image as an 'added value' when valuating products in the pre-purchase phase and could make the difference between brand A or B (Leone et al. 2006). If the consumer had a good experience with the apple, the chance rises that the consumer will re-buy the apple. How harder it is to determine the quality of the product attributes before purchase, the bigger the influence of a brand upon buying intention and purchase. With apples the risk is bigger to buy an inferior or highly perishable product without noticing it in the store. Buying a well-known brand reduces the risk of a bad buy (Riezebos et al. 2005)

For a company it is important to know which consumers are buying their products. There are after all a lot of different consumers with different preferences. Therefore it is important to create Segments with consumers which have the same (homogeneous) preference within the Segments, but different preferences (heterogeneous) between the Segments. By knowing which Segments exist, it becomes easier to find the most suitable Segment for the apple. By actively targeting a Segment which is most suitable, a company is able to set certain associations and 'unique' benefits in the head of the consumer (Aaker 1991). In other words set a unique market positioning in the head of consumers (see introduction). Companies target these Segments by creating and positioning a brand (Aaker 1991, Kotler 1999). Because there are different consumers with different preferences it will be researched which Segments exist and which preferences are the most important in each separate Segment. The Segments will assumable have different quality expectations due to the difference in importance upon the preferences. The different quality expectations will therefore assumable influencing the buying the buying before consuming the apple:

*H1 Buying intention before consuming the apple is influenced by the different Segments.*

### **2.3.2 The influence of smell on quality expectations**

Another sense organ which consumers use is smell. The aroma of an apple is an intrinsic product attribute and cue which consumer use to predict the flavour of the apple. (Dalton et al. 2010). So does the aroma of sodium-saccharin in apple indicate a sweet taste. Furthermore, the stronger the perceived aroma is the more flavour is expected by consumers (Delwiche 2003). Thus, also without actually consuming the apple do consumers use the aroma to predict the flavour/taste of the apple in pre-purchase phase. Aroma also influences the flavour perception during the actual consumption of the apple (Delwiche 2003). Next to determining the flavour by using the aroma of the apple, does

the aroma of the apple also help to predict the quality of the apple. E.g. the smell of ethylene is an indicator of how mature the apple already is and could be a cue for a softer apple.

### 2.3.3 The influence of touch on quality expectations

The third sense organ which consumers use during pre-purchase is touch. Touch has a persuasive influence on consumers' attitude and behaviour. Consumers create by touching products more confidence in their evaluation and therewith the purchase intention increases (Peck et al. 2006). In case of fruit, touch is also very important in the first quality judgement. By touching the product consumers try to determine the firmness of the apple. And by feeling the firmness, consumer try to predicted the texture (Shewfelt et al. 1993). In line with texture consumers try to predict maturity by feeling the apple. A more mature apple feels softer and the peel could feel more wrinkled. By touching and squeezing the apple consumer is able to test the firmness and therefore the product attribute "texture" of the apple (Shewfelt et al. 1993).

Based on all the cues brand, Touch, Smell, Colour, Shape, Size and sight consumers develop an expected quality of the apple. This expected quality assumable influences the buying intention before consumption. Hypothesis 5 will test this assumption.

*H5 Expected quality influences the buying intention before consumption.*

Furthermore, the quality of the product attributes of the apples are declining throughout the year(Dijk 2014). It is unknown if consumers change their expectations throughout the year. Therefore the following Hypothesis is constructed:

*H6 Expected quality of the product attributes is negatively influence by time after harvest.*

## 2.4 Determining quality after consuming the apple

Consumer use the cues mentioned above to find the best product to fit their preferences. Therefore those cues are used to fill in the first quadrant of the theoretical model. The actual tasting and testing of the product happens during and after consumption. Only by consuming the apple, the consumers are able to test the promised quality of the product attributes.

### 2.4.1 The influence of taste on perceived quality

Taste can be separated into texture and flavour (Delwiche 2003). When tasting an apple, consumers evaluate the texture on level of crunchiness, juiciness, hardness and corniness. The flavour is tested on level of sweetness, freshness and sourness. Only during the consumption of the apple the consumers can test if the quality of the perceived product attributes is overlapping with the expected quality of the product attributes. In case of an apple; Does the texture and flavour of the apple overlap with the expectations of the texture and flavour of the apple. The better the overlap between the expected quality and perceived quality of the product attributes the more satisfied the consumer will be, provided that is fulfils the preferences of the consumer (Thurstone 1985, Steenkamp 1987, Fornell 1992). So, after tasting the apple, the level of satisfaction is set. This will also influence the buying intention (Giese et al. 2000). Based on this knowledge the following Hypothesis can be formulated:

*H2 Perceived quality influences the buying intention after consumption.*

Furthermore, the quality of the product attributes of the apples are declining throughout the year (Dijk 2014). It is unknown what the impact is of time upon the perceived quality among consumers. Therefore the following Hypothesis is constructed

*H7 Perceived quality of the product attributes is negatively influence by time after harvest.*

## 2.5 Consumer satisfaction and loyalty

Consumer satisfaction is described as 'An emotional or cognitive response upon a particular focus, (like an experience, product, etc.) on a particular time, like consumption, after choice etc.' (Giese et al. 2000). Satisfaction is an overarching term for a varying intensity of affective responses. Consumers prefer emotional terms to describe their level of satisfaction (Selnes 1993). Examples of those terms are, Very Satisfying, Cheated, Frustrating, Pleasant, Extraordinary, etc. to express their level of satisfaction (Giese et al. 2000).

On the moment the apple is being consumed, the consumer evaluates the perceived quality with the expected quality (Fornell 1992). If the quality of perceived product attributes are equal or better than expected quality, the consumer is satisfied. Therewith the chance of re-buying the product and loyalty to the product grows. Consumers are highly brand sensitive when buying fresh food products (Riezebos et al. 2005). On the other hand the level of involvement is rather low. This is called behavioural loyalty (Kandampully et al. 2000). Behavioural loyalty means consumers are used to buy the same apple time after time. However, when the apple is not in stock or the quality starts to disappoint consumers will easily switch to other products (Riezebos et al. 2005). Based on this knowledge the following Hypothesis can be formulated.

*H3 Buying intention before consumption influences the buying intention after consumption*

*H4 Perceived quality has a bigger influence upon buying intention after consumption than buying intention before consumption.*

*H10 Based on the cues before consuming the apple, the consumer can already predict the level of satisfaction after consuming the apple*

*H11 Overall level of satisfaction declines by time after harvest*

Furthermore, the quality of the product attributes of the apples are declining throughout the year (Dijk 2014). It is unknown what the impact is of time upon the expected and perceived quality and therefore buying intention among consumers. Therefore the following Hypothesis are constructed:

*H8 Willingness to buy an apple declines, before consuming the apple, by time after harvest.*

*H9 Willingness to buy an apple declines, after consuming the apple, by time after harvest.*



# Chapter 3 Theoretical model

To test all the formulated Hypotheses in Chapter 2, the following model is constructed:

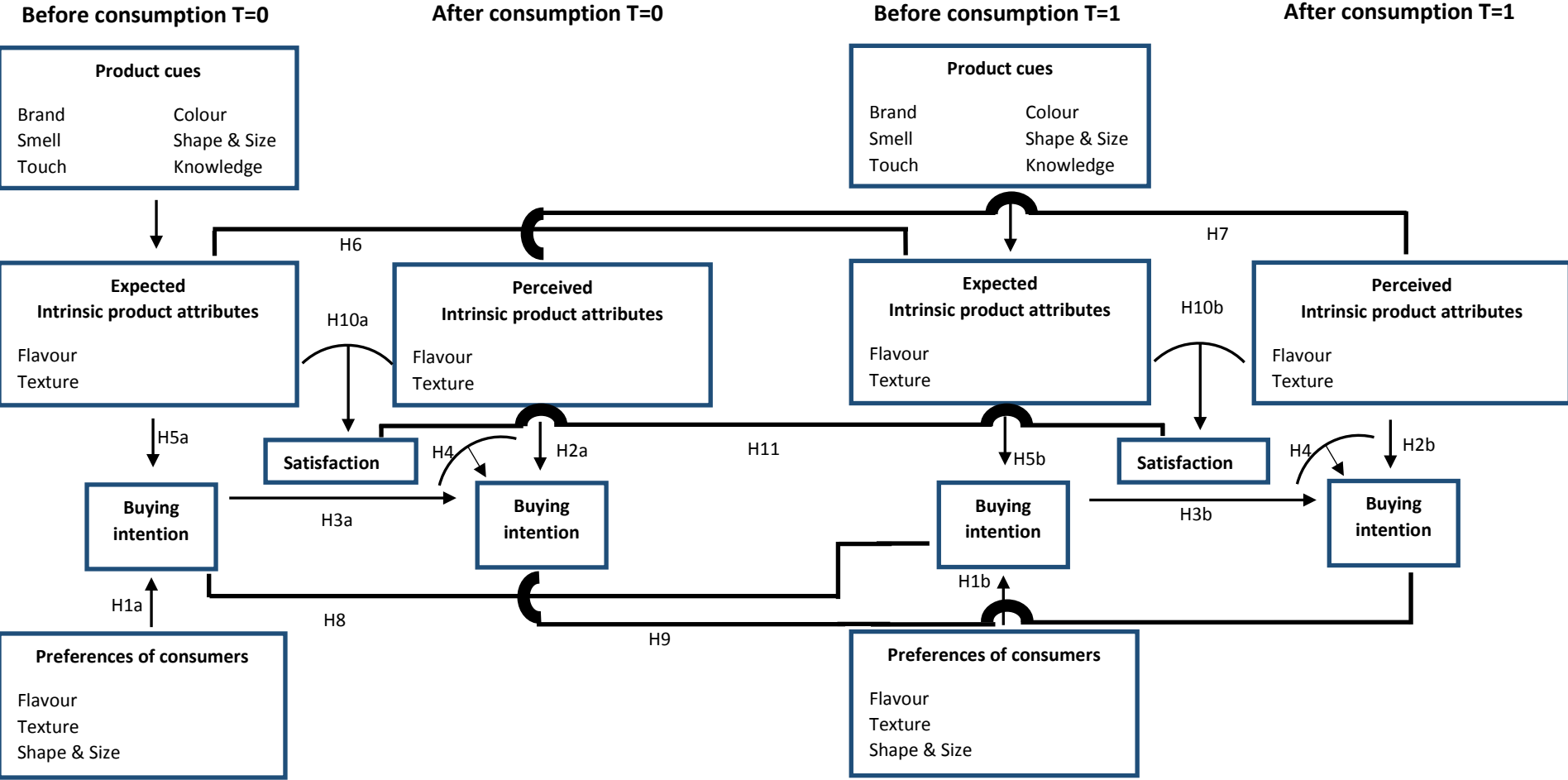


Figure 1. Theoretical frame work

## Chapter 4 Method

This chapter describes which methods and which materials are needed for the research. In the first Section the choice of apples will be provided. In the second Section the sample used in the experiment will be described. The third Section will provide insights in the design of the questionnaire. The last section will discuss the analysis of the data.

### 4.1 Apples in the experimental design

There are hundreds of apple varieties in the world (Pippin 2014), therefore it is important to limit the amount of apples that are included in the experiment. In the first subsection the selection criteria is determined for the apples. In the second subsection the apples which are included in this research will be discussed.

#### 4.1.1 The selection

First of all, all the apples which are included in this research need to be sold in the Netherlands. Secondly a clear distinction is made between apples which are: A) Available for 6 till 8 months, B) Available for 10 till 12 months. This distinction is made to explore the effect (positioning, buy intention and loyalty) between apples which are available for 6 months and therefore have constant quality and apples which are available for 10 months and therefore have a fluctuating quality. Thirdly, a clear distinction is made between apples which are a) National harvested, b) International harvested. The distinction is made to explore the effect of freshly harvested import apples and apples which have been stored for X month in a cooled storage.

The two distinctions together give four quadrants, see Table 4.1, it was impossible to find apple varieties which were suitable for Ab. Due to the many countries which produce and export apples, the combination of an international apple which is sold in the Netherlands only for 6 till 8 was impossible to find. For example the Braeburn apple, this apple is grown by Italia, France, Chilli and New Zealand which makes the apple available for the complete year due to the different growing seasons in the different countries. The high amount of apple producing countries made a lot of apple varieties suitable for Bb. Therefore, in case multiple apples were suitable for a quadrant, the two apples varieties with the largest Dutch market share were used in the experiment. The apples in this research are listed in Table 4.1.

Table 4.1: Apples in experiment

	<b>A) 6 till 8 month for sale</b>	<b>B) 10 till 12 months for sale</b>
<b>a) National</b>	<p style="text-align: right;"><b>Aa</b></p> <p>Kanzi Junami</p>	<p style="text-align: right;"><b>Ba</b></p> <p>Elstar Jonagold</p>
<b>b) International</b>	<p style="text-align: right;"><b>Ab</b></p> <p style="text-align: center;">-xxx-</p> <p>All import apples are available for at least 10 months.</p>	<p style="text-align: right;"><b>Bb</b></p> <p>Royal Gala Pink Lady</p>

#### 4.1.2 Chosen apples

The following part will give a brief background about the apples and why the apples are chosen for this experimental design.

Elstar  (Juicy, Sweet & Sour)

Background	Why this apple
<p>The Elstar apple has the biggest market share in the Netherlands. The apple is harvested in September and for sale till June (10 months). A farmer who grows this apple stores the apple himself/herself and sells the apple when he/she thinks it is the right time. In other words, every farmer is independent and gives a fluctuating quality among the apple during the year.</p> <p><a href="http://programma.groentenenfruit.nl/Elstar">programma.groentenenfruit.nl/Elstar</a> (Dutch)</p>	<p>The Elstar is selected to test the impact of fluctuating quality upon loyalty and buying intention.</p>

Jonagold  (Juicy, Sweet & Sour)

Background	Why this apple
<p>The Jonagold apple is the second largest apple in the Netherlands. The apple is harvested in September and is 12 months available for sale. Like the Elstar apple the Jonagold apple is grown and sold by the farmer himself. This gives a fluctuating quality.</p> <p><i>(no website available for this apple)</i></p>	<p>The Jonagold is selected to test the impact of fluctuating quality upon loyalty and buying intention.</p>

Junami  (Juicy, Sweet & Fresh)

Background	Why this apple
<p>The Junami is a Swedish apple which is grown by Dutch farmers. The Junami is harvested in October and available from January till June (6 months). All the Junami apples are stored by a distributor who makes sure the apples have a 'constant' quality. Furthermore Junami is a well-branded apple with a well-defined character.</p> <p><a href="http://Junami-apple.com">Junami-apple.com</a></p>	<p>The Junami apple is selected to test the impact, of not selling the apple for 4 months, upon loyalty and buy intention.</p>

Kanzi  (Juicy, Sweet & Sour)

Background	Why this apple
The Kanzi apple is a Dutch club apple which is harvested in October and only available till May (8 months). All the Kanzi apples are stored by a distributor which makes sure the apples have a constant quality. Furthermore Kanzi is a well branded apple with a well-defined character and growing market share. <a href="http://Kanziapple.com">Kanziapple.com</a>	The Kanzi apple is selected to test the impact, of not selling the apple for 4 months, upon loyalty and buy intention.

Pink Lady  (Juicy, Sweet & Sour)

Background	Why this apple
The Pink Lady is freshly harvest in September . However, during the year fresh apples are imported from other counties to keep the quality level constant. Furthermore Pink Lady is a well branded apple with a well-defined character. <a href="http://appel-pinklady.com">appel-pinklady.com</a>	The Pink Lady is chosen to emphasize the quality difference between freshly imported apples and apples which have spent 10 months in a cooled storage.

Royal Gala  ( Juicy, sweet)

Background	Why this apple
The Royal Gala is produced in France, Brazil, Argentina, Chili and New Zealand, thereby freshly harvest apples are available the complete year round.  <i>(no website available for this apple)</i>	The Royal Gala apple is chosen to emphasize the quality difference between freshly imported apples and apples which have spent 10 months in a cooled storage.

## 4.2 Sample

The respondents used in this study were approached in the University of Wageningen. Most of them are Wageningen students between 18 and 26 year. Respondents were randomly drawn from the research population. Data are obtained from 58 respondents in the first measurement and from 67 respondents in the second measurement. Both groups received the same questionnaire and the same apple varieties. The assumption is made that all the respondents consume apples and therewith do have knowledge on how they normally select apples in a supermarket. Measurement 1 and 2 both took place in a time period of five days, Monday till Friday. By taking a period of five days, different respondents were able to join the research. Each day approximately 10 till 15 random respondents joined the research. Because 98% of the respondents are students, the research is only representative for students.

### 4.3 Design of Research

With the online survey tool 'Qualtrics' a questionnaire is designed, the questionnaire can be found in Appendix A. To measure the impact of the factor time, the measurement needs to be conducted twice, therefore the design is a longitudinal design (Vaus 2001). The measurement in May included an 8 month old Kanzi, 8 Month old Junami, 8 month old Jonagold, 8 Month old Elstar, 1 Month old Royal Gala and a 1 month old Pink Lady. The second measurement in September included in time after harvest a 1 week old Kanzi, 1-2 week old Junami, 1-2 week old Elstar, 1-2 week old Jonagold, 1-2 week old Royal Gala and a 5-6 Month old Pink Lady. All the apples were bought in the same supermarket. In this research all the apples were bought at the Albert Heijn in Wageningen.

Before starting the real experiment, a pre-test is conducted to test the questionnaire on small errors. The pre-test is conducted with 9 respondents, randomly drawn from the research population. After the outcome of the pre-test the questionnaire was optimized by small adjustments and feedback on the size of the apple slices consumers consumed during the experiment. After the implementing the feedback the questionnaire was ready for the experiments.

The first subsection describes how the preferences of the respondents is measured. The second subsection describes how the expected quality and perceived quality is measured. The third subsection provides insights in how buying intention is measured. The fourth subsection describes how satisfaction is measured. The last subsection describes the procedure of the research.

#### 4.3.1 Measuring preferences

To obtain data of the preferences of the consumers the respondents are asked to answer general questions about their preferences. It is asked: *"When you buy an apple, how desirable is it that:"* following to the question the respondent needed to judge seventeen attributes. E.g. *"That the apple is expensive"*, *"that the apple is fresh"*, *"That the apple is Hard"*, *"That the apple is Dutch"*, etc. The respondents needed to score the seventeen questions on a five point rate scale, in which 1 = very undesirable and 5 = very desirable.

#### 4.3.2 Measuring quality

The 'quality' of each apple is asked twice in the experiment. The expected quality is asked before consumption and the perceived quality after consumption. First the expected quality will be discussed, secondly the perceived quality.

##### 4.3.2.1 Expected quality

To measure the expected quality of an apple the respondents is asked to judge an apple purely based on Touch, Smell, Vision and Knowledge. In other words, the respondent was not allowed to eat the apple yet. By doing this the respondent needed to follow the cues given by the apple and the earlier experience he/she have with the apple. During the judgement the respondent needed to answer 12 questions. It is stated *"I expect that the #name apple# apple"*: following to the statement the respondent needed to judge 12 attributes. E.g. *"Is Hard"*, *"Is Sweet"*, *"Is imported"*, *"is tasty"*, etc. The respondents needed to judge the apple on a 5 point Likert scale, in which 1= strongly disagree and 5= strongly agree.

#### 4.3.2.2 Perceived quality

To measure the perceived quality of an apple the respondent is asked to eat a slice of an apple, provided by the researcher. During the consumption of the apple the respondent needed to judge 8 attributes. It is stated *"I find that the #name apple# apple"* following to the statement the respondent needed to judge 8 attributes. E.g. *Is Hard*", *Is sour*", *Is juicy*", *is mealy*", etc. The respondents needed to judge the apple on a 5 point Likert scale, in which 1= strongly disagree and 5= strongly agree.

#### 4.3.3 Measuring buying intention

The buying intention of each apple is directly measured in the questionnaire on two different moments in time, once before consuming the apple and once after consuming the apple. The first buying intention is purely based on Touch, Smell, Vision and Knowledge about the apple. The second measurement is based upon the perceived texture and flavour of the apple. To measure the buying intention the respondent is asked: *"How big is the chance that you are going to buy the #name apple# apple in the supermarket within two weeks?"* The respondent needed to answer this question on a 11 point Juster scale, in which 1= No Chance. *"Almost no Chance (1 out of 100 times)"* and 11= *"Certain, practically certain (99 out of 100 times)"*. By both measurements, before and after consumption, the same question is used. By doing this the buying intention before and after consumption can directly be compared with each other.

#### 4.3.4 Measuring satisfaction.

The level of satisfaction of each apple is directly measured in the questionnaire on two different moments in time, once before consuming the apple and once after consuming the apple. The first measurement of satisfaction is purely based on Touch, Smell, Vision and Knowledge about the apple. The second measurement is based upon the perceived texture and flavour of the apple. To measure the satisfaction of the respondent it is stated: *"I give the #name apple# apple the following grade"*. The respondent needed to give a grade on a scale of 0 till 10. By both measurements, before and after consumption, the same question is used. By doing this the level of satisfaction before and after consumption can directly be compared with each other.

#### 4.3.5 Procedure

When a respondent is willing to take part in the experiment, the respondent is asked to take place behind a laptop. The questionnaire starts by asking which of the six apples included in the research the respondents already buys. Then the preferences of the respondents is asked. After filling in the questions about the preferences the respondent receives 1 out of the 6 apples. The respondents needed to judge the apple purely based on Touch, Smell, Vision and Knowledge and needed to fill in the question about the expected quality. After filling in the question about the expected quality of the apple the buying intention and level of satisfaction of the apple is asked to the respondent. Then the respondent receives a slice of the apple. During the consumption of the apple the respondent is asked for the perceived quality, based on the texture and flavour the respondent is perceiving on that moment. Then again the buying intention and satisfaction of the apple is asked to the respondent. The process is repeated until the respondent has judged all the six apple included in the research. Before closing the questionnaire the respondent is asked for his/her age, gender and country of origin. After finishing the questionnaire, the respondent can pick one of the 6 apples as a reward for participating in the research. The researcher records the choice of the apple by filling in the last question of the questionnaire, *'chosen apple'*.

## 4.4 Analysis

After conducting two experiments the data is ready to be analysed. Similar Hypothesis will be dealt in one Section. First the analysis of the Segments will be discussed.

### 4.4.1 Market Segments

*H1<sub>a+b</sub> Needs of consumers influence the buying intention before consumption.*

Based on the preferences of the respondents a cluster analysis will be conducted. The goal of clustering is creating homogenous groups within the clusters and heterogeneous groups between the clusters (Sclove 2001). The first step is reducing the amount of variables by doing a principal component analysis. The principal component analysis will be conducted to restrain overlap and redundancy between the attributes. Based on the eigenvalue, and total variance explained the amount of factors will be determined. E.g. the eigenvalue should be larger than 1, and the variance explained should be larger than 50% but preferably above 60%.

The second step in cluster analysis is conducting a hierarchical cluster analysis. This analysis starts from N clusters to 1 overall cluster. The hierarchical method starts with each respondent as a separate cluster. During each "step" of the analysis the clusters closed to each other are combined, with one final cluster as result. Based on the results of the agglomerative Table the variance between the clusters is calculated. Based on the difference in variance the amount of cluster is determined, e.g. if the variance between cluster 4 and 5 is smaller than 10% the amount of clusters will be 4. In other words, the 10% will be used as a cut-off level.

However there is a chance some cases are 'trapped' in hierarchical analysis because the clusters closest to each other are combined in the hierarchical cluster analysis. As a result the heterogeneity within the cluster grows, e.g. a X number of respondents in cluster 1 should be placed in cluster 2, 3, or 4 and vice versa to create more homogenous Segments. To create more homogenous Segments a non-hierarchical cluster analyses is used. The number of clusters and centroids of the hierarchical cluster analysis are used as input for the non-hierarchical cluster analysis. To create the smallest variance within the Segments the ward method is used. This method does not combine the most similar object but the object which create the smallest degree of variance possible in each cluster. However, the data must be checked on outliers, otherwise the analysis will be inefficient (Sclove 2001).

The next step is analysing the effect of the Segments upon the buying intention of each apple. In other words, do the consumers in different Segments prefer a different apple and is there correlation shown upon buying intention and Segment. This will be analysed by using an one way Anova.

### 4.4.2 Influence of quality

*H2<sub>+b</sub> Perceived quality influences the buying intention after consumption.*

*H3<sub>a+b</sub> Buying intention before consumption influences the buying intention after consumption*

*H5<sub>a+b</sub> Expected quality influences the buying intention before consumption.*

The influence of quality will be research with a regression analysis. In case of H2 it is tested, by a multiple regression analysis, if the variables tasty, hard, mealy, juicy, crunchy, sweet, sour, fresh before consumption has influence upon buying intention before consumption. The same procedure will be used to analyse the effect of buying intention before consumption upon the buying intention after consumption.

#### 4.4.3 Buying intention

*H4<sub>a+b</sub> Perceived quality has a bigger influence upon buying intention after consumption than buying intention before consumption.*

This will be tested by using a linear regression analysis in which the effect of the perceived quality upon the intention after consumption is tested against the effect of buying intention before consumption upon buying intention after consumption.

#### 4.4.4 Satisfaction

*H10 Based on the cues before consuming the apple, the consumer can already predict the level of satisfaction after consuming the apple.*

To analyse the difference between expected satisfaction and perceived satisfaction a paired T-test will be used.

#### 4.4.5 Quality throughout time

*H6 Expected quality of the product attributes is negatively influence by time after harvest.*

*H7 Perceived quality of the product attributes is negatively influence by time after harvest.*

To analyse the similar, longitudinal, Hypotheses 6, 7 a general linear model (GLM) test will be used. The GLM is able to analyse the effect of an independent variable upon multiple depend variable. In this case the effect of time upon the expected and perceived quality variables. The output of, Hotteling's Trace will be used to check if time has an effect upon quality. The parameters of the test will be used to see how strong the influence of time is upon each dependable quality variable.

#### 4.4.6 Satisfaction and buying intention throughout time

*H8 Willingness to buy an apple declines by time after harvest before tasting the apple.*

*H9 Willingness to buy an apple declines by time after harvest after tasting the apple.*

*H11<sub>ab</sub> Freshly harvested apples are more satisfying.*

By using an independent t-test the satisfaction and buying intention of each apple can be measured throughout time. By using a paired T-test the satisfaction between the quadrants Aa (Dutch and 8 months for sale), Ba (Dutch and 12 months for sale) and Bb (Imported 12 months for sale) will be tested.



## Chapter 5 Results

### 5.1 Market Segments

The first step in analysing the data is determining which Segments exist among the respondents. To gain this knowledge a cluster analysis is conducted. The principal component analysis reduced the amount of variables from 18 to 7 factors. All the factors have an eigenvalue above 1.000 and together the 7 factors explain 66.1% of the data. Based on the seven factors, six significant clusters were found by using a cut-off level of 9% based on the agglomerative Table of the hierarchical cluster analysis. Based on the input of the hierarchical clustering the non-hierarchical cluster analysis constructed six new heterogeneous clusters with the smallest possible variance in each cluster. The Segments are shown in Table 5.1.

Table 5.1 Market Segments

Preferences attributes. *	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6
Green	2.59	<b>3.50</b>	<u>1.67</u>	3.00	2.91	3.10
Red	4.33	<b>4.50</b>	4.33	<u>3.00</u>	3.26	3.38
Cheap	4.09	3.80	4.28	<u>3.80</u>	<b>4.38</b>	<u>3.24</u>
Expensive	1.59	1.80	1.78	2.30	<u>1.44</u>	<b>2.52</b>
Round	<u>2.77</u>	<b>3.80</b>	3.28	3.15	2.97	3.19
Cylindrical	2.73	<u>1.70</u>	2.94	2.85	<b>2.97</b>	2.95
Tasty	<b>4.95</b>	<u>4.50</u>	4.89	<u>4.50</u>	4.94	4.81
Dutch apple	<b>4.18</b>	3.60	3.56	3.25	<u>2.85</u>	3.05
Import	<u>1.68</u>	2.40	<b>2.83</b>	2.60	2.82	2.81
Sweet	3.64	4.20	<b>4.22</b>	3.90	4.18	<u>3.57</u>
Fresh	4.64	<b>4.90</b>	4.33	<u>3.90</u>	4.76	4.29
Sour	<b>3.27</b>	2.50	<u>1.83</u>	2.75	2.56	3.10
Hard	4.18	<b>4.40</b>	3.22	<u>2.85</u>	4.18	4.05
Juicy	4.09	<b>4.70</b>	4.17	<u>3.90</u>	4.47	4.14
Crunchy	4.32	4.40	4.32	<u>3.45</u>	<b>4.50</b>	4.05
Mealy	<u>1.55</u>	<b>2.00</b>	1.72	<b>2.00</b>	1.74	1.62
Big	2.86	3.10	<b>4.00</b>	<u>2.45</u>	2.85	3.95
Small	3.00	3.50	2.28	<b>3.55</b>	<b>3.55</b>	<u>1.86</u>
N=	22	10	18	20	34	21

\*1= Undesirable 5= Very desirable

When taking a closer look to the Segments, the Segments distinguish themselves upon shape, size, land of origin and price, not upon taste. The Segments suggest that the tastiness of the apple is most important in each Segment. Tastiness scores in each Segment above 4.50 on a scale of 5 and the Student Newman Keuls test indicates there is no significant difference between the Segment upon tastiness. Also the Juiciness and sweetness of an apple do not show any significant difference in the Student Newman Keuls and are therefore of equal importance in each Segment. The other attributes like Hardness, Shape, Country of origin seem to be of a different importance in each Segment. The following Segments are constructed based on Table 5.1:

1. Segment 1; Harvested in the Netherlands, sour and not mealy\*
2. Segment 2; Red, Green, Not Cylindrical but round, Very Fresh, Hard and not mealy apple \*
3. Segment 3; Not green, Red, Not sour, Sweet, Big. Imported\*
4. Segment 4; Not too hard, Not too crunchy, Colour does not matter, Small apple.\*
5. Segment 5; Cheap, small and crunchy apple, Country of origin does not matter\*
6. Segment 6; Big apple, Willingness to pay more.\* \* Taste is most important!

### 5.1.1 Influence market Segments upon buying intention

*“H1<sub>a+b</sub> Needs of consumers influence the buying intention before consumption”*

To check if the needs of consumers have influence upon the buying intention before consumption per apple an one way Anova is used. The results are shown in Table 5.1.1. The results show that there is a difference between the Segments upon the buying intention of the Elstar apple. The Student Newman Keuls results indicate that consumers in Segment 2 are more likely to buy the Elstar apple compared to other Segments. However, the result must be interpreted with caution. Only one case of the 36 possibilities showed a significant difference. **Hypothesis 1 is Rejected.**

Table 5.1.1 Influence per Segment upon buying intention before consumption (BiBc)

	Buying intention mean per Segment					
<b>Apple</b>	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5	Segment 6
Kanzi	4.14	5.50	4.83	4.85	4.82	4.90
Junami	4.00	5.20	4.11	4.35	3.68	4.00
Elstar	8.18	<b>9.80</b>	7.83	7.15	7.47	6.90
Jonagold	5.18	4.40	7.00	5.70	6.03	6.86
Pink Lady	4.40	3.90	4.89	4.45	5.03	5.48
Royal Gala	3.77	5.20	5.39	5.90	5.24	5.10

**Bold** is significant at 5%

## 5.2 Quality influence upon buying intention

The second step in the model is measuring the influence of different variables upon the final buying intention. This can be measured by conducting a regression analysis.

### 5.2.1 Influence perceived quality and expected buying intention upon final buying intention

*"H2<sub>ab</sub> Perceived quality influences the buying intention after consumption"*

*"H3<sub>a+b</sub> Buying intention before consumption influences the buying intention after consumption"*

*"H4<sub>a+b</sub> Perceived quality has a bigger influence upon buying intention after consumption than buying intention before consumption"*

Table 5.2.1 shows the results of the influence of the perceived quality variables and buying intention before consumption (BiBc) upon buying intention after consumption (BiAc). It is seen that BiBc and Tasty, Fresh and Juicy influence the BiAc. There are also three concepts constructed to test if the BiBc variable or the perceived quality variable has more impact on BiAc. The first concept is "BiBc alone", which only includes the BiBc variable. The second concept "Perceived quality alone" exist out the variables Tasty, Sweet, Fresh, Sour, Hard, Juicy, Crunchy and Mealy. The third concept includes all the quality and BiBc variables and is named "Perceived variables and Bibc Together".

In Table 5.2.1 is seen concept "BiBc alone" ( $R^2$  0.624; P 0.000) as well as the concept "perceived quality variables alone" ( $R^2$  0.456; P 0.000) have an influence upon BiAc. An extra analysis is run in which the concept "BiBc alone" and the concept "perceived quality alone" were tested against the concept "BiBc and perceived quality together". Because the concept "together" has a large  $R^2$  value compared to the other concepts the model will be (more) significant. By using a chow test is tested if the  $R^2$  increase is significant or not. The results in Table 5.2.1 show the influence of the concept "BiBc and perceived quality together" ( $R^2$  0.805; P 0.000) is stronger than using the concepts apart of each other. In other words, to predict BiAc both concepts are needed. **Hypothesis 2 & 3 are accepted, Hypothesis 4 is rejected.**

Table 5.2.1 Influence perceived quality and influence of buying intention before consumption upon buying intention after consumption.

<b>Variables</b>	<b>Concept:</b> "BiBc alone"	<b>Concept :</b> "Perceived quality alone"	<b>Concept :</b> "Perceived variables and Bibc together"
	<u>Coefficient</u>	<u>Coefficient</u>	<u>Coefficient</u>
BiBc	0.875	-	0.706
Tasty	-	1.520	0.886
Sweet	-	-0.061	0.075
Fresh	-	0.275	0.281
Sour	-	0.091	-0.012
Hard	-	0.018	0.013
Juicy	-	0.118	0.175
Crunchy	-	0.135	0.044
Mealy	-	-0.026	-0.064
	R <sup>2</sup> =0.624 <b>P 0.000</b>	R <sup>2</sup> =0.456 <b>P 0.000</b>	R <sup>2</sup> =0.805 Change = <b>0.000</b> <b>P0.000</b>
N=	125		

**Bold** is significant at 5%

### 5.2.2 Influence of expected quality upon buying intention before consumption

*"H5<sub>ab</sub> Expected quality influences the buying intention before consumption"*

Table 5.2.2 displays the results of the influence of the expected quality variables upon Bibc. The results show expected quality is influencing the buying intention before consumption. However, 6 out of 8 quality attributes are not significant, which is assumable due because Tasty is an overarching quality attribute. Removing tasty out of the analysis also makes Juicy, Fresh and Sweet significant. To test if all the quality attributes should be included or not the concept "Using all attributes" is tested against "Only Tasty, Price & Origin" in a chow test. Both concepts have a significant influence. But the chow test indicate that using all the attributes is significantly adding more value than using the attributes Tasty, Price & Origin alone. **Hypothesis 5 is accepted.**

Table 5.2.2 Influence expected quality upon buying intention before consumption

<b>Attributes</b>	<b>Concept:</b> "Only Tasty, Price, Origin"	<b>Concept:</b> "Using all attributes"
	<b>Coefficient</b>	<b>Coefficient</b>
Tasty	1.536	1.207
Price	-.679	-0.735
Origin	-0.590	-0.588
Sweet	-	0.048
Fresh	-	0.162
Sour	-	0.089
Hard	-	0.161
Juicy	-	0.044
Crunchy	-	0.034
Mealy	-	0.044
	R <sup>2</sup> =0.326	R <sup>2</sup> =0.349
	<b>P 0.000</b>	Change = <b>0.001</b>
		<b>P0.000</b>
N=	125	

**Bold** is significant at 5%

### 5.3 The effect of time

The third step in the model is testing the effect of time. In the first subsection the effect of time upon the expected quality will be discussed. In the second subsection the effect of time upon the perceived quality will be discussed. In the third subsection the effect of upon the buying intention will be discussed. In the last subsection the effect of time upon the satisfaction of the three different types of apples will be discussed.

#### 5.3.1 Expected quality throughout time

*“H6 Expected quality of the product attributes is negatively influence by time after harvest”*

The results of the effect of time upon the expected quality attributes, analysed with a general linear model test (GLM) are shown in Table 5.3.1. The test indicates there is an effect of time upon expected quality. The quality attributes which are effected by time are Sweet, Fresh and Hard. However, according to the coefficients of Sweet and Fresh are the apples expected to become sweeter and fresher by time after harvest. This is a positive change instead of a negative. Furthermore the overarching quality attribute ‘tasty’ is not expected to change throughout time. Consumers actually expected that the tastiness of the apple and therefore quality is equal throughout the year. Only the hardness of the apple is expected to change negatively throughout time. Looking at all the attributes it is seen that consumers do expect apple quality changes. However, it also looks like the consumer does not exactly know what is changing. Because the Hypothesis is focussing on a negative change instead of a positive change the GLM is run again without the attributes Fresh and Sweet. When removing the attributes Sweet & Fresh the test shows there is not a difference in expected quality throughout time (p=0.480). **Hypothesis 6 is rejected.** Although, it must be taken into account that consumer do expected the hardness of the apples declines throughout time.

Table 5.3.1 Influence of time upon expected quality variables

Tests & Attributes			
<b>Test:</b>		<b>P value</b>	<b>P value</b>
Hotelling's Trace		<b>P 0.003*</b>	P 0.480#
	<b>Mean</b>	<b>Mean</b>	
<b>Attributes:</b>	<u>September</u>	<u>May</u>	<b>P value</b>
Tasty	3.76	3.76	P 0.466
Sweet	<b>3.69</b>	<b>3.83</b>	<b>P 0.008</b>
Fresh	<b>3.63</b>	<b>3.77</b>	<b>P 0.010</b>
Sour	2.83	2.73	P 0.070
Hard	<b>3.70</b>	<b>3.57</b>	<b>P 0.024</b>
Juicy	3.73	3.74	P 0.470
Crunchy	3.71	3.63	P 0.168
Mealy	2.55	2.59	P 0.158
N=	125		

**Bold** is significant at 5%

\*= With Sweet & Fresh

# = Without Sweet & Fresh

### 5.3.2 Perceived quality throughout time

*“H7 Perceived quality of the product attributes is negatively influence by time after harvest”*

Table 5.3.2 displays the effect of time upon the perceived quality variables. It is shown that time has a significant effect upon quality throughout time, the Hotelling’s Trace is significant at  $p = 0.048$ . When looking closely at the quality variables independently, it is seen that the overarching quality attribute ‘tasty’ is significant. The coefficient indicates there is a negative influence of time. Also the hardness, juiciness, corniness (mealy) and crunchiness are significant influenced by time, all correlated to mouth feel and texture of the apple. According to the data do apples become softer, mealier and less juicy throughout time. The flavour dimensions on the other hand is not influenced by time. The test shows that apples did not change in perceived sweetness, sourness or freshness. **Hypotheses 7 is accepted.** Perceived quality is negatively influenced by time after harvest.

Table 5.3.2 Influence of time upon perceived quality variables

Tests & Attributes			
<b>Test:</b>	<b>P value</b>		
Hotelling’s Trace	<b>P 0.048</b>		
	Mean	Mean	
<b>Attributes:</b>	<u>September</u>	<u>May</u>	<b>P value</b>
Tasty	<b>3.71</b>	<b>3.55</b>	<b>P 0.023</b>
Sweet	3.60	3.69	P 0.095
Fresh	3.65	3.61	P 0.307
Sour	3.35	3.21	P 0.105
Hard	<b>3.35</b>	<b>3.21</b>	<b>P 0.048</b>
Juicy	<b>3.63</b>	<b>3.53</b>	<b>P 0.012</b>
Crunchy	<b>3.72</b>	<b>3.57</b>	<b>P 0.024</b>
Mealy	<b>2.46</b>	<u><b>2.56</b></u>	<b>P 0.018</b>
N=	125		

**Bold** is significant at 5%

### 5.3.3 Buying intention before consumption throughout time

*“H8 Willingness to buy an apple declines, before consuming the apple, by time after harvest”*

*“H9 Willingness to buy an apple declines, after consuming the apple, by time after harvest”*

The effect of time upon buying intention is displayed in Table 5.3.3. An independent t-test is used to test the effect of time. As shown in Table 5.3.3. is there a negative effect of time for buying intention before consumption as well upon buying after consumption. **Hypothesis 8 & 9 are accepted.** But the effect is different per apple. The Kanzi, Junami and Jonagold do not show an effect of time upon buying intention. The Pink Lady and Elstar only show an effect of time after consumption. The Royal Gala is the only apple who experience an effect of time upon buying intention before and after consumption of the apple.

Table 5.3.3 Influence of time upon buying intention

<u>Moment of consumption</u>	<u>Mean</u>		<u>P value</u>
	<u>September</u>	<u>May</u>	
Before consumption	5.66	5.13	<b>P 0.003</b>
After Consumption	5.81	5.25	<b>P 0.005</b>
N=	125		

**Bold** is significant at 5%



## 5.4 Satisfaction

*H10 Based on the cues before consuming the apple, the consumer can already predict the level of satisfaction after consuming the apple*

*H11 Freshly harvested apples are more satisfying*

Table 5.4.1 displays the results of a paired t-test conducted upon the satisfaction before and after consuming the apple in September and May. Table 5.4.2 displays the effect of time upon the expected and perceived satisfaction. The results in Table 5.4.2 are based upon an independent t-test. There are three quadrants in which an apple can be located. Kanzi and Junami are a quadrant named Aa (Dutch apple 6-8 months for sale). Elstar and Jonagold are a quadrant named Ba (Dutch and 12 months for sale) and Pink Lady and Royal Gala are a quadrant named Bb (Imported and 12 months for sale).

The results in Table 5.4.1. indicate that the satisfaction before consuming the apple do not always meet the satisfaction after consuming the apple. The Pink Lady and Elstar in measurement 1 and the Kanzi in measurement 2 did exceed the expectation of the consumer. The Royal Gala and Jonagold showed no differences and the Junami disappointed the consumer. Based on the cues of the apple the consumer cannot (always) predict the quality of the attributes. **Hypothesis 10 is rejected.**

Table 5.4.1 Mean satisfaction before and after consumption.

Satisfaction	Quadrant	Kanzi Aa	Junami Aa	Elstar Ba	Jonagold Ba	Pink Lady Bb	Royal Gala Bb
Before consuming. September		7.88	<b>6.75</b>	<b>8.31</b>	7.49	<b>7.70</b>	7.55
After consuming. September		8.04	<b>5.66</b>	<b>8.73</b>	7.82	<b>8.13</b>	7.43
Before consuming. May		<b>7.88</b>	<b>7.07</b>	8.40	7.60	7.72	7.43
After consuming. May		<b>8.50</b>	<b>6.26</b>	8.22	7.72	7.72	7.05
N=		125	125	125	125	125	125

1 = not satisfied; 10 = satisfied **Bold** = significant at 5%

Table 5.4.2 The effect of time upon mean satisfaction before and after consumption.

Satisfaction	Quadrant	Kanzi Aa	Junami Aa	Elstar Ba	Jonagold Ba	Pink Lady Bb	Royal Gala Bb
Before consuming. September		7.88	6.75	8.31	7.49	7.70	7.55
Before consuming. May		7.88	7.07	8.40	7.60	7.72	7.43
After consuming. September		<b>8.04</b>	<b>5.66</b>	<b>8.73</b>	7.82	8.13	7.43
After consuming. May		<b>8.50</b>	<b>6.26</b>	<b>8.22</b>	7.72	7.72	7.05
N=		125	125	125	125	125	125

1 = not satisfied; 10 = satisfied **Bold** = significant at 5%

The results in Table 5.4.2. indicate that consumers before consuming the apple have the same level of satisfaction in September and May. The results indicate that time is not influencing the level of satisfaction before consuming the apple. Assumable the cues, which consumers use to determine the product quality of the attributes of the apple, are stable throughout the year for each apple. The level of satisfaction after consuming the apple and the influence of time of time upon the level of satisfaction is dependable per apple. The level of satisfaction after consuming the Kanzi and Junami is positively influenced by time, the satisfaction after consuming the Elstar is negatively influenced by

time. Jonagold, Pink Lady and Royal gala do not show any influence of time upon the level of satisfaction after consuming the apple. The results in Table 5.4.1 and 5.4.2 indicate that consumers cannot always predict the quality of the attributes of the apple, based on the cues provided by the apple and brand. Therefore the level of satisfaction will assumable be influenced. Because the results are different per apple an extra independent t-test is run overall all the apples. The results are presented in table 5.4.3.

Table 5.4.3. Mean satisfaction over all apples

Satisfaction	September	May
before consumption	7.61	7.58
After consumption	7.64	7.68

N= 125

1 = not satisfied; 10 = satisfied

**Bold** = significant at 5%

The results in Table 5.4.3. indicate there is not an influence of time upon satisfaction. However, the satisfaction after consuming the apple is 0.03 higher than the satisfaction before consuming the apple in September. In May the satisfaction after consuming the apple is 0.10 lower than the satisfaction before consuming the apple. The different level of satisfaction can have several explanations:

1. The apples used in the measurement in September are of a different year of harvest than the apples in May. Perhaps 2014 was a better year to grow apples than 2013.
2. The cues in September and May are of the same but the quality of the product attributes is poorer in May compared to September.
3. Related to explanation 2. Consumer do not fully trust the cues anymore in September. The cues In June, July and August were not reliable and still effect the expected quality perception of consumers in September. Assumable after September, when fresh apples are sold, the cues will regain trust among the consumers because the quality of the product attributes is better.

The explanations are all based on assumptions, there is no evidence found yet. The most satisfying apples in the research are the Kanzi (Aa), Elstar (Ba) and Pink Lady (Bb). Remarkable because they are all from a different quadrant. The similarity between the apples is found in the texture the apples. The respondents have indicate that the Pink Lady, Kanzi and Elstar are the apples with the Crunchiest, Juiciest, Least mealy and Hardest perceived texture. In a linear regression the texture attributes Hard, Mealy, Juicy and Crunchy showed a positive effect upon the satisfaction after consuming the apples ( $p=0.000$ ,  $R^2=0.389$ ). Furthermore are all the significant difference between satisfaction before and satisfaction after consuming correlated with perceived texture. The Junami apple was expected to be harder than respondents perceived. The satisfaction significantly dropped. In September the Pink Lady and Elstar and in May the Kanzi were expected to be softer than perceived. The satisfaction after eating the apple positively changed in comparison with the level of satisfaction before eating the apple. However, based on the results in Table 5.4.3 **Hypothesis 11 is rejected**. Although, the results are highly dependable per apple like indicated in table 5.42. Assumable are the product attributes of the apple and therefore cues of the apple are dependable per apple variety and dependable per harvest.

## Chapter 6 Conclusion

The research question is: *“What is the impact of the fluctuating apple quality throughout the year upon the positioning and buy intentions of apple brands in the eyes of consumers?”*

Based on the perception of the intrinsic and extrinsic cues of the apple consumers do change their quality expectation of the product attributes of the apple in time after harvest. Based on the cues the consumers expect that the flavour of the apple becomes sweeter and fresher after 8 months after harvest. The Consumers also expect the texture of the apple becomes softer. However, consumers did not expect that an 8 month old apple in May will less tastier than a freshly harvest apple in September. Purely based on the cues, the consumers expected that the apple in May will be as satisfying as in September. This suggest consumers do not know that apples are freshly harvested in September and the rest of the year, if not imported, are sold from a cooled storage. But when consumers actually consume the apples, the consumers do perceive a different quality of the product attributes of the apples. Consumers indicate that an 8 month old apple has the same flavour of a Freshly harvest apple in September, but that the apple in May is less tastier because of the soft(er) texture. The texture of the older apple is perceived as less juicy, less hard, less crunchy and more mealy. Together with the decline of the perceived quality of the product attributes of the apples, does also the buying intention after consuming the apples decline.

However, the results of satisfaction in time after harvest show two contradictory results. First of all, satisfaction before consuming the apple stays equal in time after harvest. This suggest that the perception of the cues of the apple, which consumers use to determine the product quality of the attributes of the apple, stay equal throughout the year. However the data indicates there is still a change in quality expectation about the product attributes of the apple. Which is contradictory to the stable obtained level of satisfaction before consuming the apple in time after harvest. Furthermore does the buying intention before consuming the apple decline. Which suggest that consumers expect a poorer quality of the product attributes of the apple in time after harvest. Again a contradictory result compared to the stable obtained level of satisfaction before consuming the apple in time after harvest. However, the decline in buying intention could also have a different reason. Perhaps are consumers due to the season more likely to buy strawberries in May. Unfortunately there is no evidence to approve or reject this assumption. Secondly, the level of satisfaction after consuming the apple over all apples indicate that consumers are as satisfied with the apples in May as in September. Despite the fact consumers perceived a significant softer texture of all the apples in May compared to September. It would be logical that the satisfaction after consuming the apple would be lower than the level of satisfaction before consuming the apple. After all, based on the cues provided by the apple, consumers expected the apples to have a better quality of the product attributes than the actual perceived quality of the product attributes. Therefore the consumers should have been disappointed. The “mismatch” in satisfaction may be due to a small error in the questionnaire. Literature have indicated that consumers prefer to express their level of satisfaction in an emotion, like Happy, Anger, Sad, Cheerful etc. (Selnes 1993, Giese, et al. 2000). Respondents in this research needed to express their level of satisfaction in a grade. Perhaps the grade have confused the respondents and therefore influenced the data.

The data indicate that quality of an apple is mainly based upon hardness, juiciness, corniness (mealy), crunchiness and of course preference in taste. Each single apple in the research offers a different composition of the measured quality attributes and receives different responses. The Kanzi, Elstar

and Pink Lady for example are the most satisfying and at the same time also the hardest apples in the research. However, the buying behavior is not based on hardness but on earlier experience with the apple. The Table in Appendix B indicates that the Jonagold and Elstar are bought by most respondents in normal life. This is also seen in the buying behavior in the questionnaire (where 0= no chance to be bought and 11 certainly be bought). The Elstar (7.78) and Jonagold (6.38) did have the highest chance to get bought in the coming 2 weeks (Kanzi 5.69, Junami 3.30, Pink Lady 5.22 and Royal Gala 4.95). The Elstar does have the highest chance to get bought throughout the year, despite the fact the perceived quality of the Elstar becomes significant less in time after harvest. Although it must be mentioned that the Jonagold and Elstar are slowly losing market share to the club varieties like Pink Lady and Kanzi (Salm, et al. 2011) which indicates a shift in positioning and buying intention throughout time.

Choosing the best strategy among the strategies introduced in the introduction is not possible, because this research did not included a measurement after the 8 months limited. The strategies are;

1. Stop selling apples after 8 months because the quality is too poor (Kanzi & Junami).
2. Start importing apples after 8 months to keep the quality 'stable' (Royal Gala & Pink Lady).
3. Keep selling the apples after 8 months with declining quality, no import (Jonagold & Elstar).

Perhaps it seems to be the smartest option to start importing apples after 8 months. However, if for example an apple produced in the Netherlands is the comparative advantage of Kanzi and therewith reason why consumers buy the Kanzi apple. It is not smart to start importing Kanzi apples around the world, this will change the market positioning and their target group will switch to another apple. In that case it is the smartest decision to stop selling apples from May till October. According to Hypothesis 8, the respondents did not taste any differences in the perceived quality. Therefore it could be the smartest strategy to stop selling apples after 8 months. However by not supplying apples the entire year round, the consumer demand '*constant delivery*' (Alvensleben, et al. 1997) is not being fulfilled and competitive brands of Kanzi and Junami's will take over Kanzi's and Junami's part of the market share from May till October. Kanzi and Junami on their turn can only hope their consumers are so loyal, that their customers start rebuying their apple once again available in October. On the other hand foreign apple varieties like Royal Gala are freshly harvest in the month May and June and shipped to Europe. This emphasize the quality difference between the freshly harvest Royal Gala and a 10 months old Jonagold. The difference in price is negligible, the transport cost are just a few cents per kilo (Riezebos, et al. 2005). A measurement in the month June till August will answer the strategy question. Extra research is needed.

## Chapter 7 Discussion

The discussion includes the managerial implication and the limitations and recommendations of the research.

### 7.1 Managerial implication

The results of the research could be used to improve further research in this field. The firms could use the research set-up to the influences is of fluctuating quality upon their apple. However, improvements need to make on for example measuring satisfaction and buy intention. The recommendations are described below.

### 7.2 Discussion Limitations and recommendations

The biggest constrain in the research is measurement 1. In a normal planning of 5- 7 months the first step is getting familiar with the problem and writing an introduction + problem statement. The second step is conducting a literature study and framing the theoretical model. Based on this knowledge it is determined if further field research is needed. However, measurement 1 needed to be conducted at least 3 months before measurement 2. This a big constrain in a time period of 5-7 months, it therefore changed the planning. The first month was used to get familiar with the subject and framing the problem, the next step should be the literature study. However, due to the time constrain measurement 1 is conducted before the literature study and construction of the model. This resulted in a measurement which was not based upon literature study. It was for example assumed that respondents now the difference between mealy, juicy, crunchy, fresh, sour etc. Or that satisfaction can be measured on a scale from 0 till 10. Also the way of questioning could be improved. In total there are four improvements which are discussed one by one.

At first, the respondents should receive a clear definition about the variables which they are testing. The measurement in this research gave the respondents have a lot of space to misinterpret the variables. The respondents should receive a definition with the definition of the variable Hard, Sour, Mealy etc. Not supplying these definitions in this research could be the reason for remarkable findings. For example, the apples is perceived to be mealier but no difference is measured in crunchiness and hardness. Three variables which are highly correlated according to a bivariate correlation taste, all measuring the firmness of an apple.

Secondly, the question about buying intention should be changed. Now is asked; *How big is the chance that you are going to buy the xxx apple in the supermarket within 2 weeks?* This should be; *imagine yourself you are in a supermarket and on the moment to buy an apple to consume out of hand. How big is the chance that you will buy the XXX apple based on your (before tasting) expectations/ (after tasting) experience?* By reframing the question the respondent is forced to actually evaluate the apple and think about his/her buying response. The 'old' question gave the respondents room to misinterpret the question. Some of the respondents indicated they would buy the apple for a pie and not for consumption out of hand. Other respondents indicated they liked a particular apple a lot but they will not buy it because of the price, which they knew by experience. By rephrasing the question the 'noise' will be filtered out better and is purely based on the expected and perceived quality. The Juster scale of the 'old' question could still be used in the new question.

Third, satisfaction should be measured differently. The literature study indicate that consumers prefer to express their level of satisfaction with emotional words and not only with marks. However,

the data still needs to be analysable by SPSS. Therefore the question should not only asked for a number but also indicate what the numbers mean. For example after tasting it will be on a five point Likert scale; 1 = it fails to meet my expectation, 3 = equally with my exaction and 5 = it exceeds my expectations. The current question to measure satisfaction does not contain the 'body or content' to measure consumer satisfaction. The emotion is left out, while emotion is the way how consumers express their satisfaction(Giese, et al. 2000).

Fourth, the order in which the respondents receive the apples needs to be randomized. In this research every respondent received the apples in the same order; Kanzi, Junami, Elstar, Jonagold, Pink Lady, Royal Gala. This has assumable influenced the data. Kanzi was always the null measurement. In other words, all the other apples are evaluated on basis of the first apple which the respondents received. In this case the Kanzi. Furthermore could taste and texture also be of influence by order. The softer Junami was always tested after the hard Kanzi, by doing this the Junami could be perceived as even softer than 'normal'. By introducing a randomized order the influence will be tackled. An additional improvement would be to use apples of the same harvest. In this research apples of two different harvested are used.

Furthermore, the respondent's group research is not representative for the whole Netherlands. Like already mentioned in Section 5.2 is 98% of the sample a student from the Wageningen University. When conducting further research different ages and consumer groups need to be taken into account to create a representative sample for the whole Netherlands. Also the varieties of apples could be extended. On this moment only 6 apples of the hundred varieties are tested. To give a clear insight in the effect of fluctuating quality upon buying intention and satisfaction multiple apples need to be tested. At least the apples which are sold in the Dutch supermarket.

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# Appendix A Questionnaire

## Introduction



Thank you for participating in this research. The research will take approximately 15 minutes, you will be asked to answer several questions and you need to taste and judge 6 apples. At the end of the research you will receive a compensation for your time. If you would like to rinse your mouth, you can use the bottle and cup. Good luck!



## Buying behaviour before the research.



Which of the following apples do you buy?

	Never	Rarely	Sometimes	Often	Always
Jonagold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kanzi	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Junami	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Elstar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Royal gala	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pink Lady	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Preferences for market Segments.




With the question below you will indicate which attributes are important for you when you buy an apple. Indicate for each attribute how desirable it is when you buy an apple. *(In other words, how positive or negative the influence is of the attribute on your choice when buying an apple)*

When you buy an apple, how desirable is it that:

	Very undesirable	Undesirable	neutral	desirable	Very desirable
The apple is expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is fresh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is small	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is green	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is mealy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is crunchy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is tasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is juicy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is big	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is round	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is sour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is red	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is sweet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is cylindrical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is hard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is imported	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The apple is cheap	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Questions per apple.


In this case the Kanzi apple, the same questions are asked for the Junami, Elstar, Jonagold, Pink Lady and Royal Gala. The questions are presented in a random order.



Ask the researcher for the **Kanzi** apple. You can feel, watch, and touch the apple, but **not taste**.


>>

Expected quality:



Imagine yourself that you are standing in the supermarket and that you are going to buy an apple. The following questions are about your expectations of the **Kanzi** apple.

>>



I expect that the **Kanzi** apple:

	Strongly disagree	disagree	neutral	agree	Strongly agree
Is produced in the Netherlands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is hard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is sweet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is sour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is expensive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is fresh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is imported	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is tasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is crunchy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is mealy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is cheap	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is juicy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Buying intention before consumption



How big is the chance that you are going to buy the **Kanzi** apple in the supermarket within 2 weeks?

- 10. Certain, practically certain. (99 op 100)
- 9. Almost sure (9 op 10)
- 8. Very probable (8 op 10)
- 7. probable (7 op 10)
- 6. Good possibility (6 op 10)
- 5. Fairly good possibility (5 op 10)
- 4. Fair possibility (4 op 10)
- 3. Some possibility (3 op 10)
- 2. Slight possibility (2 op 10)
- 1. Very slight possibility (1 op 10)
- 0. No chance, almost no chance (1 op 100)

I give the **Kanzi** apple the following grade:

- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1
- 0



## Perceived quality



Ask the researcher for a piece of **Kanzi** apple. You can taste this piece.

>>



Taste the piece of **Kanzi** apple. Then answer the questions below.

I think the **Kanzi** apple:

	Strongly disagree	Disagree	neutral	Agree	Strongly agree
Is sour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is fresh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is mealy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is crunchy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is hard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is sweet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is juicy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is tasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>

## Buying intention after consumption



How big is the chance that you are going to buy the **Kanzi** apple in the supermarket within 2 weeks?

- 10. Certain, practically certain. (99 op 100)
- 9. Almost sure (9 op 10)
- 8. Very probable (8 op 10)
- 7. probable (7 op 10)
- 6. Good possibility (6 op 10)
- 5. Fairly good possibility (5 op 10)
- 4. Fair possibility (4 op 10)
- 3. Some possibility (3 op 10)
- 2. Slight possibility (2 op 10)
- 1. Very slight possibility (1 op 10)
- 0. No chance, almost no chance (1 op 100)

I give the **Kanzi** apple the following grade:

- 10
- 9
- 8
- 7
- 6
- 5
- 4
- 3
- 2
- 1
- 0



## General questions



Gender:

Male

Female

Age

Born in the Netherlands?

Yes

No

No, in a foreign country, namely:

>>



This is the end of the research. Thanks a lot for your participation. You will receive your reward from the researcher.

If you have any remarks, you can share them in the box beneath:

>>

Chosen apple after finishing the questionnaire.



Gekozen appel

- Kanzi
- Junami
- Elstar
- Jonagold
- Pink Lady
- Royal Gala
- Geen keuze





## Appendix B Buying behaviour before experiment

Buying behaviour of 'research' apples before the questionnaire

Frequency	Kanzi	Junami	Elstar	Jonagold	Pink Lady	Royal gala
Never	414 (55.2%)	450 (60.0%)	60 (8.0%)	144 (19.2%)	324 (43.2%)	330 (44.0%)
Rarely	168 (22.4%)	174 (23.2%)	96 (12.8%)	162 (21.6%)	174 (23.2%)	186 (24.8%)
Some time	102 (13.6%)	90 (12.0%)	222 (29.6%)	234 (31.2%)	150 (20.0%)	138 (18.4%)
Regularly	60 (8.0%)	36 (4.8%)	276 (36.8%)	186 (24.8%)	96 (12.8%)	90 (12.0%)
Always	6 (0.8%)	0 (0.0%)	96 (12.8%)	24 (3.2%)	6 (0.8%)	6 (0.8%)
N=	750 (100%)	750 (100%)	750 (100%)	750 (100%)	750 (100%)	750 (100%)