



Iris van Kruijsbergen

Registration number: 930828-484-170

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Wageningen University - Marketing and Consumer Behaviour

Supervisor: Dr. Ir. Ellen van Kleef

Second examiner: Ir. Victor Immink

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## Abstract

**Objective:** Although there is an increasing interest in the influence of different factors in the food environment on consumption behaviour of individuals, the influence on healthy snacking has never been researched at meeting rooms. The objective of this study is to examine the research question: What is the influence of vegetable presentation (mixed vs separate), nutrition message (present vs absent), and product packaging (present vs absent) on the amount of snack vegetables consumed during meetings by meeting participants?

**Methods:** Both a field experiment and an online lab experiment were conducted. The four week field study utilized a 2x2 quasi-experimental design, in which vegetable presentation was crossed with nutrition message. Vegetable presentation was manipulated by offering a bowl containing either one type of snack vegetable or two types of snack vegetables mixed. The nutrition message was either absent or present in the meeting room. The online lab experiment utilized a 2x2 between-subjects design, in which packaging was crossed with vegetable presentation. Packaging was either present or absent, whereas vegetable presentation was manipulated the same as in the field experiment.

**Results:** The results of the field experiment show that both the way in which vegetables are presented (mixed vs separately) and nutrition message did not have a significant influence on the amount of snack vegetables consumed per person per meeting. Also the online lab experiment did not find a significant influence of vegetable presentation on the consumption intention of individuals with regard to healthy snack vegetables. Nevertheless, this online lab experiment found significant main effects of packaging on convenience, sensory appeal and the consumption intention with regard to healthy snack vegetables. Consumers do experience namely more convenience, a higher level of sensory appeal and are more likely to consume snack vegetables without a packaging. However, no main effect of packaging on the attitude towards the offered amount of snack vegetables was found.

**Conclusions:** Although no significant results of vegetables presentation and nutrition message on the amount of food consumed were found, the amount of snack vegetables consumed per person per meeting was 74 grams. Therefore, availability is promising in stimulating the healthy snack consumption of individuals.

**Keywords:** snacking, consumption, perceived variety, nutrition message, packaging, food environment

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## 1. Introduction

A healthy diet contributes to an overall sense of well-being (Shepherd et al., 2006), helps individuals to stay healthy and prevents them from getting overweight (Martens et al., 2005). An unhealthy diet, on the other hand, is accompanied with an increased chance to get overweight and an increased risk at some diseases, such as cancer, high blood pressure and cardiovascular disease (Martens et al., 2005; Shephard et al., 2006). Therefore, a healthy lifestyle is of crucial importance for individuals (Vartanian et al., 2008). Both fruits and vegetables are essential components of a healthy diet (Wolf et al., 2005; Guenther et al., 2008). The recommended guidelines regarding the intake of fruit and vegetables differ per country. Across Europe an average of 400 grams fruits and vegetables a day is recommended, whereas in The United States a minimum of five pieces of fruits or vegetables a day is recommended (Guenther et al., 2008). Both across Europe and the United States the daily recommended amount of fruits and vegetables is not met (Wolf et al., 2005; Guenther et al., 2006). Individuals across Europe do consume a satisfactory amount of fruits each day, but they do not meet the recommended amount of vegetables (Wolf et al., 2005), whereas only forty percent of individuals in the United States meet their recommended fruit and vegetable pieces (Guenther et al., 2006).

The Dutch food-based dietary guidelines recommend individuals to eat an amount of 200 gram of vegetables and two pieces of fruit a day (Wolf et al., 2005). Only 1-14% of the Dutch people meet this recommended vegetable consumption (Van Rossum et al., 2011). This might be due to the preference of Dutch people to eat vegetables during a warm meal only, as two third of the total amount of vegetables consumed in the Netherlands was eaten when they were cooked (Wolf et al., 2005). Besides, consumers like to base their purchasing decisions on taste and convenience, which are often connected with the less healthy food options, such as snack foods (Hanks et al., 2012; Shepherd et al., 2006). Generally people choose for consuming high-fat snacks, when they have a choice between healthy and unhealthy snacks (Hsieh, 2004). Unhealthy snacks were perceived as very appealing, instantly accessible, convenient and they were associated with enjoyment, pleasure, friendship and relaxation (Hsieh, 2004; Shepherd et al., 2006). The consumption of snacks may contribute to the obesity increase (Rolls et al., 2004) and therefore the consumption of snacks is of particular interest to solve the problem of unhealthy consumption. Considering the fact that most consumers have a positive attitude towards healthy eating and they acknowledge the importance of a healthy diet (Shepherd et al., 2006), there is potential to tackle the existing obesity problem.

To tackle the obesity problem intervention studies have been conducted involving different research locations. Especially with regard to unhealthy snack consumption, a broad range of locations has been used in these studies. These locations are varying from laboratory settings (Rolls et al., 2002; Rolls et al., 2004; Kahn and Wansink, 2004; Rolls et al., 1981), a restaurant setting (Diliberti et al., 2004), a theatre setting (Wansink and Park, 2001) to university office settings (Painter et al., 2002; Wansink et al., 2006). The number of studies focusing on the stimulation of the healthy snack consumption is a lot more limited. In this field, only some interventions have been examined to increase the consumption of healthy snacks among individuals, using different locations such as a high-school (Davis et al., 2009) and a children facility (Roe et al., 2013). No research regarding both healthy and unhealthy snacking has been done at meeting rooms at the worksite yet, resulting in a new promising research location. At this location a large proportion of the adult population can be reached (Sorenson et al., 2004), a new target group will be examined and a new, real life context will be used, as employees normally consume cookies during meetings.

The amount of food eaten is strongly influenced by environmental factors, such as portion size, package size, variety, food visibility, salience, and the ease of obtaining food (Cohen and Farley, 2008; Wansink, 2004). For example, a study by Jefferey et al. (1994) has found a three times higher fruit consumption after increasing the variety of offerings and reducing the prices in a worksite cafeteria. In addition, availability turns out to influence the amount of healthy snacking, as a poor availability of healthy foods at schools prevents individuals from choosing the healthy food option, whereas the availability of healthy snacks facilitates healthy snacking (Shepherd et al., 2006; Davis et al., 2009). Also variation might be important in stimulating individuals to snack healthier. Furthermore, price might figure as an inhibiting factor on the amount of food consumption. When healthy food has a high price individuals do not choose for the healthy food options (Shepherd et al., 2006). Lastly, nutrition brochures and leaflets are aimed at attitude change (Martens et al., 2005) and they may therefore be helpful to change individuals' attitude towards healthy food options.

This thesis will examine the way in which healthy snacking during meetings at work settings can be stimulated. The influence of different factors in the food environment on healthy snacking will be studied to answer the main research question: What is the influence of vegetable presentation (mixed vs separate), nutrition message (present vs absent), and product packaging (present vs absent) on the amount of snack vegetables consumed during meetings by meeting participants?

To answer this research question two experiments will be conducted. The first experiment is a field experiment using a quasi-experimental design and will be conducted at two different ministries in The Hague. In this quasi-experiment both the influence of vegetable presentation and a nutrition message on healthy snacking behaviour during meetings will be measured. Snack tomatoes and snack cucumbers will be presented during meetings at the ministries and therewith this quasi-experiment will give insight in the behaviour of people when they are in their regular work setting. This might cause problems related to the internal validity, because it is not possible to control for external influences from this work setting, as the setting was used in its most natural way. Therefore, the second experiment in this research will be designed as an online lab experiment. In such an experiment, different factors are way better controllable and this might be helpful in determining different motives of individuals to snack healthy during meetings. The factors which will be examined in the online lab experiment will be vegetable presentation and packaging. The online lab experiment will therefore get insight in the influence of vegetable presentation and the presence of packaging on the convenience, sensory appeal, attitude towards the amount of food that is offered and consumption intention of consumers. In this research snacking will be defined as: "the consumption of foods between meals" (Savidge et al., 2007).

The results of this study may help the human resource management staff of companies with stimulating their employees to snack healthy by getting more insight in the effect of different variables on the healthy snacking behaviour of employees. As a large proportion of the adult population is working, stimulation employees to snack healthier during meetings as well as changing social norms for healthy eating during meetings might be promising to improve the health of individuals (Sorenson et al., 2004). Therewith, this knowledge may be useful to improve the health of society in general.

## **2. The influence of the food environment on snacking behaviour of vegetables**

To get more insights in the consumption behaviour of individuals this chapter will start with explaining the importance of the food environment, including the boundary model and the importance of the food environment on the fruit and vegetable consumption. Thereafter, the influence of automatic behaviour on consumption decisions will be discussed. Next, the role of availability will be explained. Lastly, the role of three different food environment factors on the snacking behaviour of individuals will be covered, being packaging size, nutrition message and vegetable presentation.

### **2.1 The importance of the food environment on food consumption**

A lot of studies have examined the influence of external cues in the environment on food consumption and it turns out that a lot of different factors influence the eating behaviour of individuals. Factors such as packaging size, vegetable presentation, plate size and the presence of others might influence the consumption of individuals (Wansink, 2004). Also availability, study pressure, having health problems, social activities and peoples' beliefs and habits seem to be important factors for individuals when they are able to choose different snack options (Hsieh, 2004).

#### **2.1.1 The boundary model**

To explain why individuals are affected by the food environment and why interventions strategies make use of such environmental cues the boundary model will be discussed. This model contains two basic and contrary features of the human body, being hunger and satiety (Bilman et al., 2015). On the one side individuals might experience feelings of hunger, whereas on the other side they might feel they are full. When these feelings of fullness are experienced, individuals will stop consuming food. But external cues in the food environment turn out to have a stronger influence on individuals than both hunger and satiety (Bilman et al., 2015). This might be promising in regulating the unhealthy snack consumption of individuals in society, as different factors in the food environment are strongly influential on the consumption behaviour of individuals. It is, for example, more likely that the availability of palatable snacks results in overeating than saying overeating is caused by the internal demand to be sated (Herman and Polivy, 2005).

#### **2.1.2 The importance of the food environment on the fruit and vegetable consumption**

Consumers are generally tended to choose unhealthy snacks, which are containing high levels of fat and sugar, over healthy snacks, such as fruits and vegetables (Hsieh, 2004). These unhealthy snacks were seen as very appealing and convenient by individuals, because they do not require any preparation (Hsieh, 2004). The contrary is true for fruits and vegetables, for which inconvenience and preparation time were often mentioned as consumption barriers (Schätzer et al., 2010). Therefore, it is interesting to go deeper into the motives consumers have to buy fruit and vegetables, which will be discussed in the next section.

The most important purchase motivations for consumers to buy minimally processed vegetables and packaged fruits are related to convenience and speed (Ragaert et al., 2004). These factors seemed especially important for consumers purchasing these vegetables or fruits during weekends (Ragaert et al., 2004). When asked for the motivations to buy minimally processed vegetables convenience was the most important, according to 44.9% of the Belgian consumers. The second most important motivation was quickness, mentioned by 20.0% of the Belgian consumers. The vegetables included in this study were different types of mixed lettuce, where packaged fruits included strawberries in a tray, strawberries in a tub, covered with foil, red raspberries, blueberries and juniper berries (Ragaert et al., 2004).

In addition, a related study examined the importance of different packaging attributes in the buying process of consumers. This study was conducted in Thailand, which is known as a very competitive packaged food product market. This research also found convenience and ease of use to be the most important factor to buy a food product (Silayoi and Speece, 2007). The product attribute, including both convenience and ease of use, was called packaging technology in this study and its relative importance was 32.5%.

Both studies looked at characteristics of the market segment including convenience oriented consumers. When analysing different product characteristics, these types of buyers tend to be less interested in information, taste and health compared to other types of buyers (Ragaert et al., 2004). Also shape, colour/graphic and layout of the packaging are not of high importance to these consumers (Silayoi and Speece, 2007). These convenience oriented consumers did not have a special preference for the different product designs presented in this study, which were varying from a straight shape to a package with a picture on the right and information on the left. They only had a slight preference for detailed information (Silayoi and Speece, 2007). Besides, it turns out that the importance of product attributes varies per consumption stage. When the consumer is buying a food product the appearance of the product, the transparency of the packaging, information on the packaging, shelf life date and content of the packaging were more important attributes of the product. Whereas during consumption consumers seemed to be more focused on the shape- and feeling of the packaging, suggestions for use, feeling-, texture- and odour of the product (Ragaert et al., 2004).

## **2.2 Consumption is often driven by automatic decisions**

To examine the impact of different factors in the food environment on the amount of healthy snacks individuals consume, insight in the behaviour of individuals is needed. This behaviour can be distinguished into automatic behaviour and controlled behaviour, also defined as system 1 and system 2 thinking by Kahneman (2003). System 1 covers fast, automatic, effortless, associative decisions in which emotions are often involved. System 2, on the other hand, is characterised by slow, deliberate, controlled and effortful decisions (Kahneman, 2003). Most of the time people use automatic behaviour in response to their environment (Cohen and Farley, 2008). Automatic behaviour is performed without awareness, unintentional, uncontrolled and performing this behaviour takes individuals little effort and is therefore efficient (Bargh, 1994; Cohen and Farley, 2008). Simple reactions, such as laughing about jokes, frowning when people are annoyed or tensing muscles when they feel threatened are examples of automatic behaviours. These reactions are made automatically, without conscious thinking and most of the time people are not even aware they are performing this behaviour (Cohen and Farley, 2008).

Often, eating is an automatic behaviour as well, as people do not always eat consciously (Cohen and Farley, 2008; Harris et al., 2009). Portion size, food visibility and the ease of obtaining food strongly influence the amount of food being consumed by individuals (Cohen and Farley, 2008). Fast-food restaurants are combining these characteristics, because in these types of restaurants the portion size is determined, food is visible, and most importantly food can easily be obtained. Over the last years, the energy intake of United States citizens is strongly increased, especially the consumption of pizza, cheeseburgers, soft drinks and French fries increased (Nielsen et al., 2002). These foods require the least effort to eat and people do not need any utensils to eat them (Cohen and Farley, 2008). All automatic behaviours can be controlled temporarily, but most of the time this requires effort. People are for example able to refuse palatable snacks, such as chocolates at the jar, but this takes effort. The needed amount of mental effort is substantial and therefore it is not possible to resist temptation on long term (Cohen and Farley, 2008).

### **2.3 Availability of food strongly drives consumption**

The availability of food turns out to be an important factor in influencing the snacking behaviour of individuals (Hsieh, 2014). Simply the salience and availability of food is a reason for people to consume food (Wansink, 2004). People often simply forget to eat fruits and vegetables and fruits are not always available at the workplaces or for lunch (Briz et al., 2008). Therefore it is important that these healthy products are made better available (Schätzer et al., 2010). Consumers themselves are also expecting an increased availability of healthy food options to be one of the most effective ways to improve healthy eating (Bos et al., 2013). Different studies have proven this influencing role of availability on the snacking behaviour of individuals (Davis et al., 2009; Neumark-Sztainer et al., 2005; Van Kleef et al., 2012).

A study in which the availability of fresh fruit and vegetable snacks in classrooms was manipulated, found an increased consumption of these snacks (Davis et al., 2009). In this study baskets of fresh fruit and vegetable snacks were placed in different classrooms of the intervention school every morning. Students were allowed to eat these snacks till no more fruit and vegetables were left. The availability of these fruits and vegetables influenced the intake of fruit and 100% fruit juice of the intervention school students significantly. This was proven by the fact that 39.3% of the students at the intervention school reported they consumed fruit and 100% fruit juice compared to 27.3% of the students at the comparison school (Davis et al., 2009).

Likewise, another study has found that the consumption of snacks increased when the number of snack machines at high schools was larger (Neumark-Sztainer et al., 2005). In this study the vending machine purchases of high school students from 20 different schools were compared with each other. Some of these schools did not have any snack vending machines, whereas four schools had five till seven vending machines. The snack vending machines included different snacks, such as candy bars, chips, candy, pretzels and pastry. The results showed that students purchased snacks more frequently when a greater number of snack food vending machines was present. Students at schools with one or two vending machines purchased snacks on average 0.8 days/week, whereas students at schools with six or seven snack vending machines made snack food purchases an average of 1.1 day/week (Neumark-Sztainer et al., 2005).

On the other hand, a non-significant increase in healthy snack consumption was found when a shelf display contained more healthy food products compared to when less healthy food products were available (Van Kleef et al., 2012). In one condition the shelf display on the picture contained 75% healthy food products, whereas in the other condition only 25% of the food products were healthy. In both conditions, consumers had a choice between fresh and dried fruit and vegetables, savoury and salty snacks and sweet biscuits and chocolates. Increasing the assortment structure resulted in a non-significant increased healthy snack selection of 30.4% by consumers (Van Kleef et al., 2012).

*Table 1: Illustrative studies on availability of food products and its effect on snack selection*

<b>Authors</b>	<b>Intervention</b>	<b>Setting</b>	<b>Results</b>
Davis et al., 2009	Baskets with fresh fruits and vegetables available in classrooms compared to the control group	Two American high schools	Increased intake of fruit and 100% fruit juice by intervention school students compared to students at comparison schools
Neumark-Sztainer et al., 2005	Comparing the snacking behaviour of high school students at schools with a different number of vending machines	20 high schools in the Minneapolis/St. Paul metropolitan area in America	A limited number of vending machines at school grounds resulted in fewer purchases by high school students
Van Kleef et al., 2012	Shelf assortment with 75% healthy snacks vs. assortment with 25% healthy snacks	Laboratory setting with a computer	Increasing the percentage of healthy snack products at a supermarket shelf resulted in an increased healthy snack selection of 30,4% by consumers

## **2.4 Portion size as a driver of consumption**

This section will explain the impact of portion size on the amount of fruit and vegetables consumed by individuals. Different related subjects will be explained. First of all, this section will zoom in at the robustness of the portion size effect. Secondly, some studies using unhealthy food products are presented. Lastly, an overview of some studies using healthy snacks will be given.

### **2.4.1 Robustness of the portion size effect**

The effect of portion size on the consumption of adults has been widely studied in both laboratory and real life settings and using different kind of food products (Fisher and Kral, 2008). Some example of food products being used in these experiments are beverages, pre-packaged snacks, first course salads, foods containing different energy densities, different types of vegetables, cereals, pastas and soups (Fisher and Kral, 2008; Zlatevska et al., 2014). In general, the portion size effect is substantial, as doubling the portion size results in an increased average consumption amount of 35% (Zlatevska et al., 2014).

Some factors seem to be influential on the relationship between portion size and consumption. One of them is the shape of a food product, as this influence the difficulty of judging the size of a food product. Both children and adults have more difficulties to determine the size of amorphous foods which do not have a defined shape (such as a pasta entree of macaroni and cheese) compared to more distinctively shaped foods (such as sandwiches). Apparently, children are even more unaware of these food shapes, as they did not hardly notice the doubling of the portion size of amorphous foods. Their perception of the portion size seemed to be based on the diameter and height of the food item (Fisher and Kral, 2008).

In addition, the role of a suggested consumption norm seems to be important in the relationship between portion size and consumption. When people are given a package with snacks, they might see this quantity as an acceptable amount to consume (Wansink, 2004). It is easy for consumers to consume the amount of snacks a package contains as determining how much to eat or drink is a low-involvement behaviour for most people (Wansink, 2004). People consume the whole portion, because they like the food and there is no reason to stop continuing their appetite till a certain extent (Herman and Polivy, 2005).

The review of Zlatevska et al., 2014 did also find that people stop consuming a food product at a certain point, as a doubling of the portion size led to an increased consumption amount of 35% and not 100%. Their explanation is that people will consume a fixed percentage of the food that is served to them, which can be varying per person. Some people will finish their plate, whereas others will leave 10% as this is considered as polite and some others might consume less because they are following a diet (Zlatevska et al., 2014). Furthermore, package size might stop individuals to consume more snacks after some time. A psychological barrier might prevent them from opening a new package when they have already consumed several packages of snacks (Wansink, 2004). This is also known as the unit bias heuristic in which individuals view a single entity as the appropriate amount to consume or consider (Geier et al., 2006). Explanations are often social. Individuals often consider taking a second portion as inappropriate (Herman and Polivy, 2005). Individuals might also be afraid to look greedy when consuming a lot of free food (Geier et al., 2006). And especially women might be afraid to eat too much (Geier et al., 2006).

#### **2.4.2 Impact of the portion size effect on unhealthy food consumption**

As mentioned above, a broad range of food products have been examined when looking at the relation between portion size and consumption amount. This section will explain four of these studies in detail, chosen for well-known and highly cited studies (Rolls et al., 2002; Diliberti et al., 2004; Rolls et al., 2004; Wansink and Park, 2001).

The first study, in which different portions of macaroni were offered to respondents, showed an increased energy intake of 30% when the respondents were offered a large portion of 1000 grams of macaroni compared to when they were offered a small portion of 500 grams of macaroni (Rolls et al., 2002). A related effect was found in a study in which some restaurant customers were offered a larger portion of a certain pasta entree. Half of the customers purchased a standard pasta entree option containing 248 grams, whereas the other half of the customers purchased a larger entree portion of 377 grams. The energy intake of customers who consumed the larger portion was 43% (172 kcal) higher than the energy intake of customers who consumed the normal pasta portion. The energy intake of the entire meal also increased with 25% for customers who consumed the large pasta portion (Diliberti et al., 2004).

The other two studies were in particular focused on the influence of packaged snacks at the consumption amount, because this package dimension could have a different impact than meals. A study investigating the amount of potato chips found that the consumption of potato chips increased when a larger chips bag of 170 grams was offered to respondents compared to when they were offered a smaller chips bag containing 28 grams (Rolls et al., 2004). Women's consumption increased with 184 kcal when they were offered the larger chips bag compared to the condition in which they were offered the smaller chips bag, whereas men's consumption increased with 311 kcal (Rolls et al., 2004).

Another study found that the portion size of packaged popcorn had a direct effect on the amount of popcorn being consumed. The amount of popcorn consumed was 53% higher when consumers ate from a large popcorn container compared to consumers who ate from a small popcorn container. Interestingly, this effect occurred both when consumers rated the popcorn as tasting relatively favourable and when the popcorn was rated as tasting relatively unfavourable (Wansink and Park, 2001).

### 2.4.3 Impact of the portion size effect on healthy food consumption

As mentioned above, a broad range of food products have been examined when looking at the relation between portion size and consumption amount. The literature using healthy food products to test this portion size effect is a lot more limited compared to the literature on the effect of unhealthy food products. This section will explain one study in which fruits and vegetables are used in detail, chosen for a well-known and highly cited study (Kral et al., 2010).

In this study children were offered three different fruit and vegetable side dishes next to a main pasta entrée with tomato sauce. The fruit side dish contained an unsweetened apple sauce and resulted in a significant increased fruit intake of 43% by children when the size of the unsweetened apple sauce was doubled. On the other hand, the amount of vegetables consumed by children, including broccoli and carrots, did not change significantly between portion size conditions. In addition, children's intake of the main pasta entrée decreased significantly (Kral et al., 2010).

*Table 2: Illustrative studies portion size effect on the consumption of food products*

<b>Authors</b>	<b>Intervention</b>	<b>Setting</b>	<b>Results</b>
Rolls et al., 2002	Small portion of 500g macaroni vs larger portion of 1000g macaroni	Laboratory setting	Increased energy intake of 30% when customers had consumed the larger portion
Diliberti et al., 2004	Standard pasta entree of 284 g vs larger pasta entree of 377 gram	Cafeteria-style restaurant on a university campus	Energy intake of customers consuming the larger portion increased 43%. Energy intake of entire meal increased with 25%
Rolls et al., 2004	Smaller chips bags of 28g vs larger chips bag of 170g	Laboratory setting	Women's consumption increased with 184 kcal when offered larger chips bag. Men's consumption increased with 311 kcal
Wansink and Park, 2001	Small popcorn container of 120 g vs large popcorn container of 240g	Large theatre near Chicago	Consumers eat an average of 53% more from a large than from a small container
Kral et al., 2010	Doubling the portion size of a fruit and vegetable side dishes	Room at the Centre for Weight and Eating Disorders at the University of Pennsylvania	Children consumed 43% more fruits when the apple sauce side dish was offered. Children's consumption of broccoli and carrots did not change significantly across conditions

## 2.5 Convenience

The place of snacks is also influencing the snacking behaviour of individuals. This can be explained by the role of effort (Levitsky, 2002; Wansink, 2004). Low effort makes snacking easier, more accessible and more convenient, which results in an increased snacking behaviour (Painter et al., 2002). The role of effort especially holds for foods which are ready to eat and do not require any preparation. Examples of such high convenience products are crackers, granola bars and fruit juice as they are more convenient to consume than for example noodles, oatmeal and microwave popcorn (Chandon and Wansink, 2002).

Also chocolate candies belong to the high convenience product category. A study in which both visibility and convenience of chocolates were manipulated found an increased total consumption of chocolates among participants when these chocolates were better visible and more convenient to take (Painter et al., 2002). Three conditions were included in this experiment. In the first condition a container with 30 chocolate candies was placed on top of the desk of the participants, being both visible and convenient. In the second condition the same container with chocolate candies was placed in the participant's desk drawer, being convenient but not visible. In the third condition the participants had to stand up to get the candies, as the container was placed 2 meters away from the desk. The container with chocolate candies was visible in this condition, but convenience was low. The consumption of candies was measured on a daily basis. Each evening, the containers were replaced with new containers containing 30 chocolate candies. When the chocolates were both visible and convenient chocolate consumption increased with 2.9 chocolates compared to when the candies were convenient but not visible. The consumption of chocolates when they were visible and convenient was even 5.6 chocolates higher compared to when the candies were visible, but the participants had to stand up and walk for them. These results indicate that convenience resulted in more chocolate consumption than visibility, as 2.7 less chocolate candies were consumed when the participants had to walk two meters compared to when they did not have to leave their desk and could just take the candies out of their drawer (Painter et al., 2002).

Another, strongly related study in which both visibility and proximity of snacks were manipulated also found an increased amount of snacking behaviour (Wansink et al., 2006). Visibility was manipulated by placing the chocolates in opaque or in clear bowls, whereas proximity was manipulated by placing the bowl with chocolates on the desk of the participants or placing this bowl 2 meters away from their desk. When a bowl with candies inside was made more visible and more proximate the amount of consumed candies was 4.6 candies higher compared to the condition in which the candies were less visible and less proximate. In the condition in which candies were proximate but not visible 1.5 more candies were consumed on a daily basis, this amount was 2.5 candies when they were visible but less proximate (Wansink et al., 2006).

*Table 3: Illustrative studies on the influence of convenience and visibility on food consumption*

<b>Authors</b>	<b>Intervention</b>	<b>Setting</b>	<b>Results</b>
Painter et al., 2002	1. Container on top of the desk of the participants, being both visible and convenient 2. Container in the participant's desk drawer, being convenient but not visible 3. Container placed 2 meters away from the desk, being visible but inconvenient	Offices at a university campus	When the chocolates were both visible and convenient chocolate consumption increased with 2.9 chocolates compared to when they were convenient but not visible. The consumption of chocolates when they were visible and convenient was 5.6 chocolates higher compared to when the candies were visible but inconvenient.
Wansink et al., 2006	Visibility → candies in clear or opaque bowl  Proximity → candies at the participant's desk or placed 2m away from the desk	Offices of different staff members across six different departments at the university of Illinois	When the candies were made more visible and more proximate, 4.6 more candies were consumed. When the candies were proximate but not visible 1.5 more candies were consumed. When the candies were visible but less proximate 2.5 more candies were consumed.

It turns out that consumers judge the consumption of fruits and vegetables as inconvenient, as some preparation effort is required (Schätzer et al., 2010). Generally participants prefer fruits that are easy to consume and do not require effort to prepare. When asked participants about their fruit consumption they reported different barriers, mainly related to inconvenience (Briz et al., 2008). Some fruits need careful washing and require difficult peeling and cutting before they can be consumed. These efforts can bring inconvenience to the daily life of individuals, as they mention they do not have time to do this preparation or they admit they are just too lazy to prepare them. Individuals like fruits which are ready for consumption after just washing and peeling those (Briz et al., 2008).

## **2.6 Nutrition message**

Nutrition education leaflets and brochures including arguments to change consumption behaviour are considered as a mean of persuasive communication (Martens, 2005). These kinds of nutrition messages can be used to change the attitude of consumers, which can be helpful in influencing their snacking behaviour (Martens, 2005). Some individuals do not know the daily recommended intake of fruits and vegetables (Briz et al., 2008). They are also not aware if they consume enough fruits and vegetables on a daily basis (Briz et al., 2008). Snack advertising is proved to influence the food intake of consumers and can be helpful in teaching consumers about the guidelines and importance of consuming enough fruit and vegetables on a daily basis (Harris et al, 2009). The same was thought by consumers themselves, as they emphasized the importance of clear nutritional information for people unfamiliar with nutritional values (Bos et al., 2013).

This section will first explain the different types of claims about nutrition and health, thereafter the general acceptance of consumers will be showed and in the end key elements of effective nutrition and health messages will be discussed.

### **2.6.1 Types of claims about nutrition and health**

Three different types of claims about nutrition and health can be distinguished, being nutrient function claims, other function claims and reduction of disease risk claims. “Calcium aids in the formation and maintenance of bones and teeth” is an illustrative example of a nutrient function claim, as it describes the role of a nutrient in development and functions of the body (Williams, 2005). Secondly, another function claim is focused on the way in which a nutrient may improve or modify the normal functions of the body. An example of such a claim is “calcium may improve bone density” (Williams, 2005). The last type of claim contains a message telling a specific ingredient may reduce the risk at some diseases (Roberfroid, 2000; Williams, 2005). An example of a reduction of disease risk claim would be “fruits and vegetables may reduce the risk at some types of cancer”. But also reducing the risk at other diseases, such as cardiovascular diseases, type 2 diabetes, infections or liver disease can be mentioned (Roberfroid, 2000).

In practice, consumers do not distinguish between the different types of claims about nutrition and health (Williams, 2005). The same results were found in another study (Van Trijp and Van der Lans, 2007), whereas a third study found different results comparing two types of health claims (Kozup et al., 2003). When looking at consumers’ perceptions of nutrition and health claims a very small effect on the perceived overall healthiness, perceived specific-health impact and claim attractiveness was found (Van Trijp and Van der Lans, 2007). In this study, German, Italian, English and American consumers were asked to rate one taste claim and two nutrition and health claims regarding yoghurts on an on-screen shelf in a supermarket. Participants had to imagine a purchase situation in which they had to pick a pack of yoghurt from the shelf. This pack included the taste claim: “tastes delicious” and they were asked to rate the yoghurt on some items. The same was asked again, but then the consumers had to imagine picking yoghurt with for example the message: “this yoghurt contains added fibre”. Respondents were asked to evaluate the nutrition health claim. Afterwards, the same situation had to be thought of, but now the yoghurt contained a different health claim, which should result in a different evaluation. Some differences in perceived newness and difficulty to understand were found across respondents, but these results show the precise way formulating the health benefit is not of the biggest interest of consumers. They seem to buy the food product because health is delivered to them (Van Trijp and Van der Lans, 2007).

On the other hand, a particular reduction of the disease risk claim in a study resulted in a reduced likelihood of getting a health disease or stroke (Kozup et al., 2003). Also the nutrition function claim included in this study resulted in the belief that the product reduces the disease risk, but this claim type resulted in more advantages. Also the attitude towards the product was more positive and consumers’ purchase intentions of the product increased (Kozup et al., 2003).

### **2.6.2 General acceptance of consumers of nutrition information**

Consumers generally believe they understand the most common claims about nutrition and health (Grunert and Wills, 2007). This understanding of consumers is tricky, as consumers often think they understand things better than they actually do (Whittingham et al., 2008). With more certainty, can be said that consumers are interested in both nutrition and nutrient content of the food they consume (Grunert and Wills, 2007). Besides, consumers generally judge intervention strategies which are designed to improve health as acceptable (Bos et al., 2013). Especially intervention strategies which are focused on low-calorie food products are accepted better when comparing these with intervention strategies focused on less healthy food products (Bos et al., 2013). Regarding these types of interventions the origin is important as well. Consumers have a sceptical attitude towards claims about nutrition and health initiated by food companies. Mostly, consumers are in favour of claims about nutrition and health approved by the government (Williams, 2005). It is important to note that consumers are different. Therefore, some consumers will be more interested in healthy food claims than other consumers (Grunert and Wills, 2007). Also the extent to which consumers are influenced by food advertisements will differ due to individual factors (Epstein et al., 2007; Anschutz et al., 2011). Furthermore, the situation and product might change the consumers' final consumption choice (Grunert and Wills, 2007).

One review article emphasized the perception, understanding, liking and use of nutrition information of food labels by consumers of 15 different European countries. Many consumers seemed to be interested in the link between health and food and would like to do something with it, such as using nutrition information to buy more healthy products (Grunert and Wills, 2007). However, consumers' interest in good taste, traditional eating and indulgence should also be considered as the most important factors when choosing a food product (Grunert and Wills, 2007).

### **2.6.3 Key elements of effective nutrition and health messages**

Perceptions of health benefits are to a large extent based on the prior beliefs a consumer has regarding a food product. These beliefs seem to be more important than the health claim information itself (Williams, 2005). On the other hand, it was found that consumers perceive claims about nutrition and health as useful. These consumers judge a product containing a claim about nutrition and health as healthier, resulting in a higher likelihood to buy the concerned product (Williams, 2015). Simple formulation adaptations to claims about nutrition and health, such as the use of cognitive psychological theories can already increase the understanding of consumers of a certain message. This was proved by the impact of small changes in a brochure, as these changes resulted in an increased information uptake by consumers (Whittingham et al., 2008). Also other factors can be taken in mind when formulating a claim about nutrition and health, as these factors make such claims more effective.

First of all, brief claims about nutrition and health turn out to be more effective than longer ones (Williams, 2005). In general, consumers like simplified information on a product package (Grunert and Wills, 2007). Consumers do not like scientifically formulated claims about nutrition and health, which are long and complex (Williams, 2005). However, their preference for different packaging formats may differ. Some consumers will like both red and green colours on the packaging of a food product, whereas other consumers will judge this combination of colours as too pushy (Grunert and Wills, 2007).

Furthermore, the delivery of new information to consumers seems to be an important influencer on the perceived effectiveness of a claim about nutrition and health. When such claims provide new information, consumers' attitude towards the product was affected positively, whereas their attitude did not change at all when the claim about nutrition and health did not provide any new information. Additionally, the medium through which the claim about nutrition and health is reaching consumers might be important to consider. When looking at the impact of a nutrition message send through a television advertisements no positive effect was found. The presence of a nutrition message in the food advertisement suppressed the automatic snacking of individuals (Harris et al., 2009). Also the observed healthiness of the food product did not change after consumers watched the advertisement. While other factors, such as the presence of fun, happiness and excitement resulted in a higher food intake by consumers (Harris et al., 2009).

## **2.7 Presentation of foods as a consumption driver**

Increasing the actual variety of food can increase the consumption volume of that food (Rolls et al., 1981; Roe et al., 2013; Kahn and Wansink, 2004). A study with three different yoghurt flavours resulted in a higher yoghurt consumption by the respondents which were offered three flavours compared to the consumers who only got offered one yoghurt flavour. The average amount of yoghurt consumers ate increased with 23% comparing these two conditions (Rolls et al., 1981).

In addition, the same effect of fruit and vegetable presentation on its intake was found in a study with preschool children (Roe et al., 2013). In here, not actual variety, but the way of presenting the offered foods was manipulated. In this study both fruit and vegetables were presented either separately or mixed towards the children. During a period of four weeks the children got a vegetable snack on one day and a fruit snack on another day each week. The vegetables used in this experiment were cucumber, sweet pepper and tomato. In one condition only one of these vegetables was offered to the children, whereas a mixture of these three vegetables was offered to the children in the other condition. The same was done with fruits, including apple, peach and pineapple. The vegetables and fruits were presented in three serving bowls, which were passed towards all the children by replacing the bowls on the table. Each child could take as many fruits and vegetables as they preferred. It should be noted that the new bowls with fruits or vegetables were offered when the fruit and vegetables in the original bowl were all eaten. Different conclusions were drawn from this experiment. Firstly, the likelihood of children consuming some of the offered fruit or vegetables increased. When fruits or vegetables were presented mixed children consumed some pieces in 94% of the cases, when the fruits or vegetables were offered separately children selected some pieces in 70% of the observations. In here, fruits were somewhat more popular compared to vegetables, as children selected some pieces of fruit snacks in 88% of all observations whereas vegetable snacks were chosen in 63% of all the observations. In addition, a higher amount of both fruit and vegetables was consumed when they were offered mixed. The fruit or vegetable intake increased by 67% (31 gram), which is one-sixth of the recommended daily amount of fruits and vegetables, compared to the separate condition (Roe et al., 2013).

This effect of the way in which a food product is offered even holds when there is no taste difference in the food products offered to consumers. A study using M&M candies found an increased consumption amount among respondents, while the manipulated presentation related to perceived variety and not actual variety (Kahn and Wansink, 2004). In this study, consumers were offered a bowl with M&M's inside, containing either seven or ten different colours. The taste of each of these different colours M&M's was exactly the same. Nevertheless it turned out that the M&M consumption was 43% higher among consumers who got offered the bowl with ten different coloured M&M candies inside compared to consumers who got offered a bowl with seven different coloured M&M candies (Kahn and Wansink, 2004).

*Table 4: Illustrative studies on the effect of food presentation on its consumption*

<b>Authors</b>	<b>Intervention</b>	<b>Setting</b>	<b>Results</b>
Rolls et al., 1981	Offering three flavours of yoghurt vs one flavour	Laboratory setting	Average amount of yoghurt consumed increased with 23% when three flavours were offered
Roe et al., 2013	Offering a mixture of three vegetables/fruits vs offering only one type of vegetable/fruit	Classrooms at childcare facility at the university park campus of The Pennsylvania State University	The likelihood of consumption increased in the mixed condition. The fruit and vegetable consumption increased by 67% when they were offered mixed
Kahn and Wansink, 2004	Offering a variety of ten different colours of M&M candies vs offering seven different colours	Well-lighted laboratory room in which a television comedy was shown	The M&M consumption was 43% higher amongst consumers who were offered ten different colours of M&M's

## 2.8 Conceptual models and hypotheses

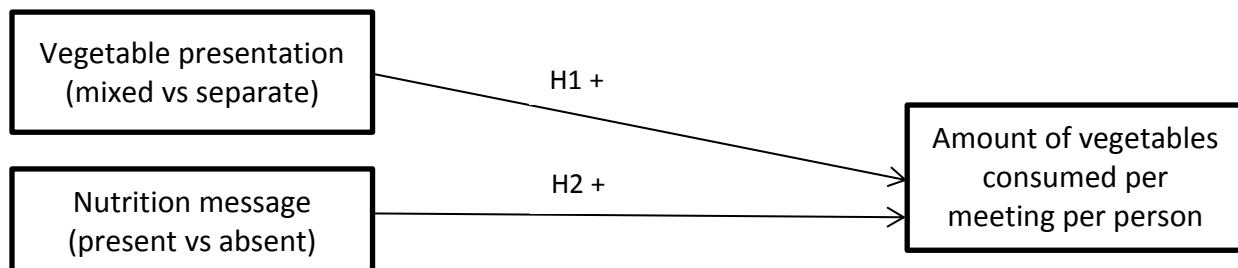
A healthy lifestyle, including eating fruits and vegetables, is essential for individuals. Both across Europe and the United States the daily recommended amount of fruits and vegetables is not met (Wolf et al., 2005; Guenther et al., 2006). Different external cues in the food environment turn out to influence the consumption behaviour of individuals. Vegetable presentation, the presence of nutrition message and packaging are three important factors which are influencing the food consumption of individuals, as presented in the previous chapter. Therefore, these factors could be helpful in stimulating the healthy snacking behaviour of individuals. This research includes two studies, being a field experiment in which vegetable presentation and a nutrition message are included and an online lab experiment in which vegetable presentation and packaging are included. The conceptual model of the field study is presented in Figure 1, whereas the conceptual model of the online lab study is presented in Figure 2.

The field experiment will examine both the influence of vegetable presentation and the presence of a nutrition message on the amount of vegetables consumed per meeting per person. The workplace is a new promising research location to examine the impact of both vegetable presentation and the presence of a nutrition message on the healthy snacking behaviour of individuals.

Different studies have found that both actual variety and vegetable presentation positively influence the amount of food consumed by individuals. Their consumption increased with 23% till 67%, compared to individuals to whom less variety in the food presentation was offered (Rolls et al., 1981; Kahn and Wansink, 2004; Roe et al., 2013). In addition, the presence of a nutrition message might positively influence the amount of vegetables consumed per meeting per person. Such a nutrition message might be helpful in teaching consumers about the guidelines and importance of fruit and vegetable consumption on a daily basis (Harris et al., 2009; Martens, 2005; Bos et al., 2013), as individuals are often not aware of these guidelines (Briz et al., 2008). With the help of the previous literature, the following hypotheses are formulated:

*H1: Presenting a bowl with mixed snack vegetables will increase the amount of vegetables consumed per meeting per person compared to presenting a bowl with separate snack vegetables*

*H2: The presence of a nutrition message in a meeting room will increase the amount of vegetables consumed per meeting per person compared to when no nutrition message is present*



*Figure 1: Conceptual model study 1*

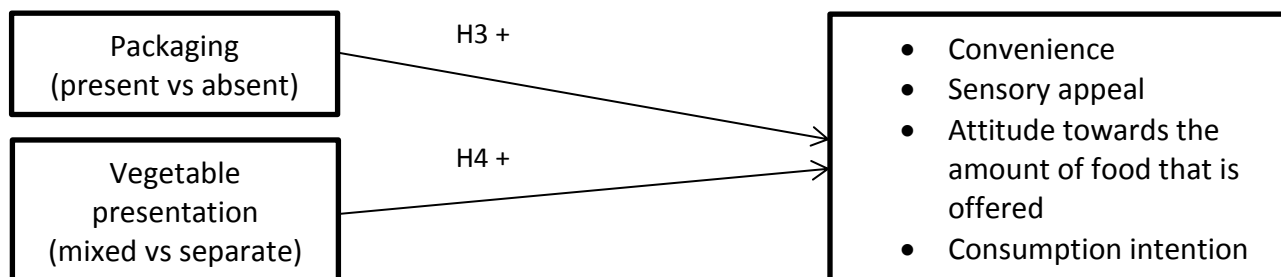
Internal validity might be a problem for the field experiment, as it is difficult to control external factors which might influence the experiment. Therefore, the second experiment in this research will be designed as an online lab experiment. In such an experiment, different factors are way better controllable and this might be helpful in determining different motives individuals have to snack healthy during meetings. The online lab experiment will examine both the influence of packaging and vegetable presentation on convenience, sensory appeal, attitude towards the amount of food that is offered and the consumption intention of individuals.

Due to packaging the consumption of snack vegetables do not require preparation time and consumption is not inconvenient. As preparation time and inconvenience were mentioned as the most important consumption barriers in relation to fruit and vegetable consumption (Schätzer et al., 2010) it is expected that packaging will increase the convenience of snack vegetable consumption. Furthermore, consumers focus on texture-, odour- and feeling of the product when they would like to consume it (Ragaert et al., 2004). Following that statement, it is expected packaging positively influence the sensory appeal of snack vegetables. Based on this literature, there will probably be a positive relationship between packaging and convenience. Individuals often see the amount of food in a package as an acceptable quantity to consume (Wansink, 2004). Therefore, it is expected individuals will probably have a positive attitude towards the amount of food that is offered. Multiple studies have found that packaging or portion size positively increases the amount of food consumed by individuals (Rolls et al., 2002; Diliberti et al., 2004; Rolls et al., 2004; Wansink and Park, 2001; Kral et al., 2010).

As mentioned above, different studies have found that the presentation of a food positively influences the amount of food consumed by individuals, which results in a consumption increase varying from 23% till 67% compared to individuals to whom less variety in the presentation of a food was offered (Rolls et al., 1981; Kahn and Wansink, 2004; Roe et al., 2013). Even no actual variety in the way in which a food is presented leads to an increased consumption, as multiple colours of M&M's with the same taste resulted in a higher consumption (Kahn and Wansink, 2004). Probably the underlying reason of the increased consumption is a higher sensory appeal when more colours of M&M's are presented in a bowl. Given the fact that consumption increased, it is also likely that both the attitude towards the amount of food that is offered and the consumption intention of individuals increased. The conceptual model of this study is presented in Figure 2. Based on literature on the portion size effect the following hypotheses are formulated:

*H3: The presence of a packaging will positively influence the convenience, sensory appeal, attitude towards the amount of food that is offered and consumption intention of consumers compared to when no packaging was present.*

*H4: A mixed vegetable presentation will positively influence the convenience, sensory appeal, attitude towards the amount of food that is offered and consumption intention of consumers compared to when vegetables were presented separately.*



*Figure 2: Conceptual model study 2*

### **3. Field experiment on the effect of a nutrition message and vegetable presentation**

#### **3.1 Method field experiment**

##### **3.1.1 Setting**

The data of the field experiment was gathered from 26 October till 19 November 2015 in two different ministries, which were both located in The Hague in the Netherlands. The first two weeks of this experiment were conducted at the Ministry of Social Affairs and Employment. The whole 20<sup>th</sup> floor of this ministry was filled with meeting rooms. These meeting rooms were separated by a corridor, so that half of the rooms were located on one side of the floor and the other half on the other side of the floor. To measure more accurately it was decided to include half of the meeting rooms, including seven meeting rooms in this experiment. One of these rooms was located just at the other side of the corridor and was used for this experiment as well. The other two weeks were used to conduct the same research at the Ministry of Economic Affairs. The meeting rooms in this ministry were located on the first floor of this building and divided over three corridors. To measure more accurately it was decided to include one corridor, containing six meeting rooms in this experiment. In both ministries, employees were able to reserve a meeting room in their building. If preferred, they could order coffee, tea and different kinds of cookies, lunches and pastries. These products were ordered at and delivered by catering service Greenco.

##### **3.1.2 Experimental design**

To measure the amount of healthy snacking during meetings a quasi-experimental design was used, as participants did not participate consciously in this study. A certain amount of snack vegetables was placed on the tables every meeting rooms with a minimum of four attendees. Two types of snack vegetables were included in this research, which were small tomatoes and small cucumbers. These vegetables are also known as “tommies” in the Netherlands. These vegetables were presented in a white, porcelain bowl for a maximum of 600 grams. Inside the bowl, on top the text “tommies” and a small picture were visible.

This experiment utilized a 2x2 quasi-experimental design, in which vegetable presentation was crossed with nutrition message. The first manipulation was vegetable presentation, including a separate and a mixed condition. The second manipulation applied to the nutrition message, which was either absent or present in the meeting room. These manipulations were not randomly assigned, but a certain procedure was followed. All the first meetings in a meeting room started in the separate condition, the second in the mixed condition, the third meeting in the separate condition again and so on. The nutrition message, about the healthiness of eating snack tomatoes and snack cucumbers, was not offered during the first week at each of the ministries. During the second week a nutrition message was placed on the tables in the meeting rooms of both ministries. Large meeting rooms got two brochures with a nutrition message, whereas in small meeting rooms only one brochure was present.

##### **3.1.2.1 Manipulation vegetable presentation**

In the separate condition only tomatoes or only cucumbers were putted in the “tommies” bowl, which is shown in Figure 3. Every meeting room started with the separate condition. The researchers weighted an amount of 100 grams per person of the vegetables and putted them in the “tommies” bowl. For example, when the meeting was reserved for eight persons the total amount of vegetables putted in the bowl was 800 grams. In the separate condition, one bowl consisted of 400 gram of cucumbers and one bowl consisted of 400 gram of tomatoes.

In the mixed condition both cucumbers and tomatoes were presented in the “tommies” bowl, as shown in Figure 4. Every second meeting in a meeting room did fall in the mixed condition. Also in here, an amount of 100 grams of snack vegetables was weighted. When the meeting room was booked for eight persons, two bowls with vegetables were placed in this meeting room. Each of these bowls was filled with 400 gram. This bowl consisted of both snack tomatoes and snack cucumbers. Half of the bowl (200 gram) consisted of cucumbers and the other half (200g) consisted of tomatoes.



Figure 3: Separate condition



Figure 4: Mixed condition

### 3.1.2.2 Manipulation nutrition message

The nutrition brochure which was placed on the tables during half of the meetings contained a nice image with different snack vegetables on it and three nutrition messages were included in this brochure, as shown in Figure 5.



Figure 5: Nutrition message

The nutrition claim on top of the brochure can be translated as: “Tommies, Funny vitamins for every day!”

The nutrition message at the right top of the brochure means: “They seem to be innocent snack vegetables, but in reality they are great vitamin sources!”

Lastly, the nutrition message in the left bottom corner says: “Eat a handful of “Tommies” snack vegetables every day and half of your daily recommended amount of vegetable is reached!”

### **3.1.3 Meeting attendees**

In total 1147 meeting attendees were part of this research. They were all working at the ministries in The Hague. The total observed meeting attendees can be divided to 55.9% (n=641) male and 44.0% (n=505) female attendees. When distinguishing the meeting attendees by the different ministries in The Hague, it was found that 556 meeting attendees took place in the research at the Ministry of Social Affairs and Employment and the Ministry of Health, Welfare and Sport. These two ministries were both located in one building, known as 'The Resident'. The observed meeting attendees who took part in the research at this building consisted of 50.2% (n=279) men and 49.6% (n=276) women. The respondents were not individually approached, but in groups together with colleagues they had the meeting with. The research at the ministry of Economic Affairs resulted in a total of 591 observed meeting attendees. Of these meeting attendees 61.2% (n=362) were male and 38.7% (n=229) were female.

### **3.1.4 Procedure**

Before the start of the field experiment, employees of the Ministry of Social Affairs and Employment were informed online about the availability of snack vegetables on the tables during meetings. The Ministry of Economic Affairs decided not to inform their employees of the availability of snack vegetables.

The study took place on Monday, Tuesday and Thursday during four consecutive weeks. Each morning the researchers got an overview of all the meetings that were going to take place on that day. This overview included the starting time, the duration of all the meetings and the amount of persons that the meeting room was reserved for. The researchers also got a list with the catering on which the offered amount of cookies, tea, coffee and water were visible. Then an overview was made by the researchers, including at what time the different meetings were starting and at what time these meetings were finished.

The expected amount each person would eat during a meeting was estimated at 100 grams per person. This amount was based on the recommended daily intake of fruit and vegetables of 200 grams per person (Wolf et al., 2005) and chosen to offer a sufficient amount of vegetables so that participants would not get out of product easily. Therefore, the researches weighted the amount of cucumbers and tomatoes following the expected consumption amount of 100 grams per person. Each of the bowls filled with snack vegetables was placed in the meeting room around ten minutes before the meeting started. Besides, the researchers observed the participants of the meetings, following a list with characteristics.

### **3.1.5 Measures**

The researchers reported the snacking behaviour of meeting attendees during meetings by filling in a list for each meeting (see Appendix I). This list included the date, condition (mixed vegetable presentation vs separate vegetable presentation), name of the meeting room, number of meeting attendees for which the room was reserved, actual number of meeting attendees, gender of meeting attendees, starting- and ending time of the meeting, the amount of tomatoes and cucumbers per bowl, presence or absence of coffee/tea, cookies, other snacks, lunch, own food brought to the meeting and external effects, such as people leaving earlier or birthday cake. Another list (see Appendix II) contained information about the meeting room characteristics and was filled in per meeting room. This list included the name and number of the meeting room, the shape of the table, the length and width of the table, the number of chairs and the placement of the snack vegetables and coffee or tea on the table.

#### **3.1.5.1 Dependent variable**

- Vegetables consumed in grams per meeting per person

To measure how many healthy snacks have been eaten during meetings, the amount of cucumbers and tomatoes placed in the beginning of the meeting as well as the amount of cucumbers and tomatoes left at the end of the meeting have been weighted on a scale. The weight of both the cucumbers and the tomatoes separately was written down. This was done by putting an empty bowl on the scale and pressing the terra button. Then the cucumbers or tomatoes were putted in this empty bowl and the researchers wrote their weight (in grams) down at a list. Afterwards the total amount of vegetables and fruits consumed during a meeting was divided by the number of people being present during the meeting. In this way, the average consumption amount per meeting per person was calculated.

#### **3.1.5.2 Control variables**

- Accessibility

For each meeting room the form of the table, length and bread of the table and the number of chairs around the table were noted. The form could either be squared, rectangular, round or oval.

- Meeting characteristics

The date, the condition (separate or mixed), the name of the meeting room, the reserved amount of people, the amount of people that were present, the starting time of the meeting, the ending time of the meeting were written down by the researchers. When there was a coffee or lunch break during the meeting the start- and the end time of this break were also written down. In addition, when people arrived later at the meeting or when they left earlier this was written down by the researchers. Furthermore, it was noted if there was water/coffee/ tea available during the meetings and if cookies, other snacks of lunch were present, the available amount was written down on the list.

- Meeting attendees characteristics

Related to the meeting attendees in this field experiment some characteristics were noted by the researchers. When the meeting attendees entered the meeting room their gender was noted. The researchers counted the woman and man who entered the room.

- Unexpected influences

During the meetings, the researchers observed if people left the meeting room, if people entered the meeting room later, if employees ate their own brought snacks and if there were other interesting effects.

#### **3.1.6 Data analysis**

First of all, the data were checked for differences across conditions, regarding the number of people present during the meeting and the percentage of men. As indicated in Table 5, randomization checks for both number of people present at the meeting and the percentage of men were successful and therefore all conditions could be implemented for the analysis of the results. In addition a two-way analysis of variance was used to analyse the data about the consumption of snack vegetables across the four conditions. These analyses were done using the statistical software package IBM Statistics 22.0. A significance level of  $P < 0.05$  was used.

## 3.2 Results field experiment

### 3.2.1 Descriptive information and randomization checks

The total data set included 136 meetings. On average 8.3 people were present during each meeting and 58.4% of the meeting attendees were men. Both the mean number of people present during meetings and the percentage of men present in meeting rooms were equally distributed across the four conditions, which is shown in Table 5. The average number of people present during a meeting varied from 8 till 8.6 attendees, whereas the average number of men present varied from 57.6% till 59.3%.

Table 5: Mean number of attendees and % of men present across all four conditions

	Vegetable presentation				Nutrition message				Main effect vegetable pres.	Main effect nutrition claim	P value for interaction effect
	Mixed (n 65)		Separate (n 71)		Absent (n 63)		Present (n 73)				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
Mean number of attendees in meeting room	8.2	4.1	8.4	4.6	8.0	3.6	8.6	4.9	0.736	0.390	0.893
% men present in meeting room	58.4	21.6	58.4	25.6	59.3	22.0	57.6	25.2	0.981	0.720	0.495

### 3.2.2 Amount of snack vegetables consumed

The average amount of snack vegetables being eaten during meetings was 73.9 (SD 43.1) grams of snack vegetables. When making a distinction between cucumbers and tomatoes, the average cucumber consumption was 33.4 (SD 22.8) grams per person and the average tomatoes consumption was 40.5 (SD 23.5) grams per person.

An ANCOVA was conducted to find out the influence of accessibility on the amount of consumption per meeting per person and to adjust for the effect of the duration time of the meeting. The snack vegetables were either accessible to meeting attendees or not accessible, so two levels of accessibility were used. Four of the twelve meeting rooms were judged as not accessible as they included large tables which made it hard for meeting attendees to reach the snack vegetables. No main effect of accessibility ( $F(1, 8)=3.054$ ,  $p=0.083$ ) on the consumption of snack vegetables per meeting per person was observed. To check whether the amount of consumption per meeting per person and the duration of the meeting were independent an ANOVA was conducted. It was found that levels of duration time did not significantly differ across group, as the p-values of vegetable presentation ( $p=0.735$ ), nutrition message ( $p=0.422$ ) and duration time ( $p=0.360$ ) were all not significant. Thereafter, an ANCOVA was conducted showing that the meeting duration did not significantly predict the amount of snack vegetables consumed per meeting per person ( $F(1, 8)=0.357$ ,  $p=0.551$ ). It also showed that the means for both vegetable presentation ( $F(1, 8)=0.002$ ,  $p=0.969$ ) and nutrition message ( $F(1, 8)=0.614$ ,  $p=0.435$ ) were not significantly different across the experimental condition after taking out the effect of meeting duration on the amount of snack vegetables consumed.

Thereafter, a two-way between groups ANOVA was conducted to explore the impact of vegetable presentation and nutrition message on the amount of snack vegetables consumed per meeting per person. As shown in Table 6, no main effects of vegetable presentation ( $F(1, 3)=0.017$ ,  $p=0.897$ ) or nutrition message ( $F(1, 3)=0.988$ ,  $p=0.322$ ) on the consumption of snack vegetables per meeting per person were observed. Also no interaction effect between vegetable presentation and nutrition claim ( $F(1, 3)=1.870$ ,  $p=0.174$ ) on the amount of snack vegetables consumed per meeting per person was found. So, participants in the condition in which both vegetable presentation and a nutrition message were present did not consume more snack vegetables per meeting compared to the participants in the other conditions. This non-significant effect can be found in the bar chart in Figure 6, showing the differences in consumption in grams across all four conditions.

*Table 6: Main effects and interaction effect of vegetable presentation and nutrition message*

Consumption of snack vegetables per meeting per person		
	F	P value
<b>Vegetable presentation</b>	0.017	0.897
<b>Nutrition message</b>	0.988	0.322
<b>Vegetable presentation * nutrition message</b>	1.870	0.174

Consumption per person  
per meeting (grams)



*Figure 6: Bar chart of the effect of vegetable presentation and nutrition message on the consumption of snack vegetables per person per meeting*

### **3.3 Discussion field experiment**

The results of the field experiment show that both the way in which vegetables are presented (mixed vs separately) and nutrition message did not have a significant influence on the amount of snack vegetables consumed per person per meeting. Internal validity might have been a problem in this field experiment, as it is difficult to control external factors which might influence the experiment.

Therefore, the second experiment in this research will be designed as an online lab experiment. In such an experiment, different factors are way better controllable and this might be helpful in determining different motives individuals have to snack healthy during meetings. The online lab experiment will examine both the influence of packaging and vegetable presentation on convenience, sensory appeal, attitude towards the amount of food that is offered and the consumption intention of individuals.

## 4. Lab experiment on vegetable presentation and packaging

### 4.1 Method lab experiment

#### 4.1.1 Experimental design

To measure the influence of vegetable presentation and the presence of packaging on the convenience, sensory appeal, attitude towards the amount of food that is offered and the consumption intention of consumers an online lab experiment was conducted. Two types of snack vegetables were included in this research, which were small tomatoes and small cucumbers. These vegetables are also known as “tommies” in The Netherlands. Each of the respondents was shown a picture of these snack vegetables inside a white, porcelain bowl for a maximum of 600 grams. Inside the bowl, on top the text “tommies” and a small picture were visible.

In this lab experiment, a 2x2 between-subjects design was used, in which packaging was crossed with vegetable presentation. By using the randomization tool in the programme Qualtrics, participants were randomly assigned to one of the four conditions. The first manipulation applied to packaging, which was either present or absent in the pictures shown to the respondents. The second manipulation applied to the vegetable presentation, including a separate and a mixed condition.

##### 4.1.1.1 Manipulation packaging

When packaging was present the snack vegetables were covered by transparent packaging material with the text “tommies” and a picture on it. Each package contained 200 grams of snack vegetables. The packaging either contained only cucumbers or only tomatoes, as shown in Figure 7 or a combination of these snack vegetables, as shown in Figure 8.



Figure 7: Packaged and only one vegetable type



Figure 8: Packaged and mixed vegetables

##### 4.1.1.2 Manipulation vegetable presentation

Regarding vegetable presentation, the same manipulation as in the first study was used. In the separate condition only tomatoes or only cucumbers were putted in the “tommies” bowl, which is shown in Figure 9. Each of the bowls contained an amount of 200 grams of cucumbers or 200 grams of tomatoes.

In the mixed condition both cucumbers and tomatoes were presented in the “tommies” bowl, as shown in Figure 10. Each of the bowls contained 200 grams snack vegetables, divided in an amount of 100 grams of cucumbers and 100 grams of tomatoes.



*Figure 9: Separate condition*



*Figure 10: Mixed condition*

#### **4.1.2 Respondents**

A total of 204 Dutch adults completed the online lab experiment, which was online from 16 till 23 February 2016. These respondents consist of 24.5% (n=50) men and 75.5% (n=154) women. On average participants were 38.7 years old.

#### **4.1.3 Procedure**

Respondents were invited by e-mail to take part in this online lab experiment (see Appendix III). In this e-mail respondents were asked if they had to attend meetings sometimes during their workday. If so, it was mentioned to the respondents that it would be nice if they would like to participate in this online lab experiment. Nevertheless, respondents were not informed about the actual goal of this study, as they were told the research was about the consumption of snack vegetables during meetings at work settings. Before taking part in the online lab experiment respondents were required to give their informed consent. They could complete the study at home at any time they would like to.

After the start of the online lab experiment, respondents were asked to imagine they would have a meeting with multiple colleagues at their worksite at the end of the afternoon, around 15.00 o'clock. Therewith, a picture of snack cucumbers and/or snack tomatoes in white, porcelain "tommies" bowl was shown to each of the respondents. This picture represented one of the four conditions, so respondents were randomly shown one of the pictures which can be found in Figure 6 up to and including Figure 9. Next, respondents were asked about their likelihood to consume snack vegetables during meetings and their opinion about the amount of snack vegetables offered to them. Subsequently, some statements about the presented snack cucumbers and snack tomatoes were presented to respondents and their agreement towards these statements were asked. Respondents were then asked about their regular snack vegetable snacking behaviour and about how they value health when eating a small snack. After this, some other statements about consuming snack vegetables during meetings were presented to respondents. Lastly, respondents were asked some general questions regarding their current employment, highest achieved education, gender and age. Respondents were then thanked for taking part in the experiment.

#### **4.1.4 Measures**

The online lab experiment contained both questions and statements on which respondents had to give their agreement. These statements were based on the food choice questionnaire (Steptoe et al., 1995) and other measures and gave insight into different motives underlying vegetable consumption. Four motives were included in this lab experiments, being convenience, sensory appeal, health and natural content. Two statements per motive were included. Respondents had to judge these statements on a seven-point scale, ranging from 1 ('completely disagree') to 7 ('completely agree'). Some of these motives served as dependent variable, whereas others figured as process variable. In the following section the measures are divided into key dependent variables, process measures and control variables and explained in more detail.

##### **4.1.4.1 Key dependent variables**

- Convenience

The first dependent variable was convenience which was measured by the following two items, based on Steptoe et al. (1995): 'It is easy to eat these snacks during meetings' and 'It does not cost much time to eat these snacks during meetings'. The reliability of this scale was  $\alpha=0.89$ . So, scores were averaged into a single convenience scale.

- Sensory appeal

The second dependent variable which was measures is sensory appeal, using the following two items, based on Steptoe et al. (1995): 'These snacks look nice' and 'These snacks have a pleasant texture'. The reliability of this scale was  $\alpha=0.80$ . Scores were averaged into a single sensory appeal scale.

- Attitude towards the amount of food that is offered

The third dependent variable was the attitude towards the amount of food that was offered. To measure the attitude a slider ranging from 0 ('way too little') to 100 ('way too much') was presented to respondents on which they indicated to what extent they think the amount of snack vegetables offered was appropriate.

- Consumption intention of individuals with regard to snack vegetables offered during meetings

To measure the consumption intention of individuals one questions asked the respondents if they would consume the snack vegetables which were shown in the previous picture. The respondents had to answer this question on a nine-point scale ranging from 1 ('definitely not') to 9 ('definitely').

##### **4.1.4.2 Controlling variables with regard to healthy snacking**

- Regular snack consumption of vegetable snacks

Respondents were asked about their snack tomatoes, snack cucumbers and similar vegetable snacks. Their answer possibilities were based on a seven-point scale and vary from 1 ('I never consume snack tomatoes or snack cucumbers') to 7 ('I consume these snacks on a daily basis').

- Importance of health when snacking

Respondents were asked about how importance health is when they consume a snack. Their answer possibilities were based on a nine-point scale and vary from 1 ('totally unimportant') to 9 ('really important').

- Respondent characteristics

In the end of the online lab experiment, some questions about current job status, education, gender and age were asked to the respondents. Firstly, respondents were asked about their current job status with three answer possibilities being 'I get paid working for a government institution or business', 'I am an independent entrepreneur', 'I am currently not paid for working'. Thereafter, respondents were asked about their highest achieved education or when still studying, which education they are enrolled in at this moment. Eight answer possibilities related to the Dutch education system were given, starting with 'Primary school' and ending with 'University degree'. Subsequently, respondents were asked about their gender, being either male or female. Lastly, respondents were asked for their age which they could indicate on a slider ranging from 16 up to an including 75 years old.

#### **4.1.4.3 Participants' opinions with regard to healthy snacking**

It is also interesting to know why people might choose not to consume the snack vegetables. To examine these motives of respondents, nine statements were included in this research. The seven-point answer possibilities of these statements varied from 1 ('completely disagree') to 7 ('completely agree'). Two of the most important consumption barriers regarding the fruit and vegetable consumption of Austrian consumers as found by Schätzer et al. (2010) were included in this research, being 'Snack vegetables are expensive' and 'The consumption of snack vegetables does not suit my lifestyle'. In addition, seven own formulated statements were included in the online lab experiments to examine why consumers choose to consume snack vegetables. Some consumers might for example not like snack tomatoes or snack cucumbers or think they do not really help to get satiated. The corresponding statements were respectively 'I like tomatoes', 'I like cucumbers' and 'This is a filling snack'. Besides, people might judge sharing snack vegetables as unhygienic, inappropriate, disturbing or surprising. Included statements covering these factors were 'I think it is unhygienic to share snack vegetables with my colleagues', 'It is inappropriate to eat this during a meeting', 'The consumption of snack vegetables during meetings is disturbing for my colleagues' and 'This is a surprising snack offered at a meeting'. The above mentioned factors were measured and described as background information. In addition, a linear regression analysis with consumption intention of individuals with regard to snack vegetables offered during meetings as dependent variable and the above mentioned ten statements as factors were conducted.

#### **4.1.5 Data analysis**

First of all, the data were checked for differences across conditions, regarding the age, gender, liking of snack tomatoes, liking of snack cucumbers, how often snack vegetables are eaten and the importance of health. Therefore ANOVA- and Chi-square tests were used. In addition, a MANCOVA was conducted to analyse the effect of packaging and vegetable presentation on the convenience, sensory appeal, attitude towards the amount of food that is offered and the consumption intention of across the four conditions. In the end a linear regression analysis was conducted to examine participants' opinions with regard to healthy snacking. The analyses were done using the statistical software package IBM Statistics 22.0. A significance level of  $P < 0.05$  was used.

## 4.2 Results online lab experiment

### 4.2.1 Respondents' characteristics

A total of 204 respondents completed the online lab experiment. The average age of these respondents was 38.7 (SD 16.1) years (range 18-75 years). Of these respondents 24.5% (n=50) was male and 75.5% (n=154) was female. The majority of these respondents got paid for working at a government institution or a company, namely 63.7% (n=130) of them. The job status of the other respondents can be divided into a group of 30.4% (n=62) who did not get paid for working at this moment and a group independent entrepreneurs, containing 5.9% (n=12) of the respondents. When looking at the education of the respondents the conclusion can be drawn the majority of them was highly educated, as 36.8% (n=75) graduated on a university of applied sciences level and 43.6% (n=89) of them graduated on a university level. Besides, 8.8% (n=18) of the respondents graduated on a more practical education level. The remaining respondents graduated on or are still following an education on high school.

### 4.2.2 Randomization checks

The average age of the respondents, tomato liking, cucumber liking and how often respondents consume snack vegetables were equally distributed across the four conditions, which is shown in Table 7. The average age of respondents varied from 37.9 till 39.5 years, whereas tomato and cucumber liking were ranging from 5.6 till 6.1. This shows that the respondents in general, did like the offered snack vegetables. In addition, across all conditions respondents indicated to eat snack vegetables two till three times a month on average. However, the importance of health was not equally distributed across the conditions, as a main effect of vegetable presentation on the importance of health when snacking ( $F(1, 3)=6.433$ ,  $p=0.012$ ) was found. To control for this influence the importance of health during snacking was included as a covariate.

Table 7: Randomization checks across all four conditions

	Packaging				Vegetable presentation				Main effect vegetable pres.	Main effect packaging	P value for interaction effect
	Absent (n 105)		Present (n 99)		Mixed (n 102)		Separate (n 102)				
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			
Age	37.9	16.0	39.5	16.2	38.8	15.9	38.6	16.3	0.941	0.476	0.281
Tomato liking**	5.8	1.6	5.6	1.8	5.6	1.7	5.8	1.8	0.643	0.357	0.068
Cucumber liking**	6.1	1.1	5.9	1.3	6.1	1.0	5.8	1.3	0.135	0.283	0.317
How often snack vegetables eaten**	4.1	1.7	4.1	1.8	4.1	1.6	4.1	1.9	0.849	0.889	0.235
Importance of health when snacking***	6.5	1.7	6.6	1.9	6.9	1.6	6.2	2.0	0.012*	0.599	0.539

\*  $p<0.05$ .

\*\* Numbers represent mean scores on a 7-point scale.

\*\*\* Numbers represent mean scores on a 9-point scale.

### 4.2.3 Influence on dependent variables

A MANCOVA was conducted with packaging and vegetable presentation as independent variables and convenience, sensory appeal, attitude towards the amount of food that is offered and the consumption intention of consumers as dependent variables (see Table 8). In this analysis the importance of health was included as a covariate.

*Table 8: Main effects and interaction effect of vegetable presentation and packaging*

	Convenience		Sensory appeal		Consumption intention with regard to healthy snack vegetables		Attitude towards the amount of food that is offered	
	F	P value	F	P value	F	P value	F	P value
<b>Vegetable presentation</b>	0.038	0.846	0.746	0.389	0.441	0.507	3.751	0.054
<b>Packaging</b>	6.862	0.009*	13.701	0.000*	7.455	0.007*	0.355	0.552
<b>Veg. presentation *nutrition message</b>	0.286	0.594	3.637	0.058	0.965	0.327	0.824	0.365

\* p<0.05.

- Convenience

No main effect of vegetable presentation ( $F(1, 4)=0.038$ ,  $p=0.846$ ) and no interaction effect of vegetable presentation and packaging ( $F(1, 4)=0.286$ ,  $p=0.594$ ) on convenience were observed. So, respondents in the condition in which both packaging and vegetable presentation were present did not experience a higher level of convenience compared to the participants in the other conditions. On the other hand, a main effect of packaging ( $F(1, 4)=6.862$ ,  $p=0.009$ ) on convenience was found. This main effect tells that respondents in the conditions in which the snack vegetables were unpackaged indicated to experience more convenience ( $M=5.63$ ,  $SD=1.359$ ) than respondents in the conditions in which the snack vegetables were packaged ( $M=5.16$ ,  $SD=1.426$ ), as convenience was measured on a seven-point scale, ranging from 1 ('completely disagree') to 7 ('completely agree').

- Sensory appeal

No main effect of vegetable presentation ( $F(1, 4)=0.746$ ,  $p=0.389$ ) and no interaction effect of vegetable presentation and packaging ( $F(1, 4)=3.637$ ,  $p=0.058$ ) on sensory appeal were observed. So, respondents in the condition in which both packaging and vegetable presentation were present did not experience a higher level of sensory appeal compared to the participants in the other conditions. On the other hand, a main effect of packaging ( $F(1, 4)=13.701$ ,  $p=0.000$ ) on sensory appeal was found. This main effect tells that respondents in the conditions in which the snack vegetables were unpackaged indicated to experience more sensory appeal ( $M=5.67$ ,  $SD=0.897$ ) than respondents in the conditions in which the snack vegetables were packaged ( $M=5.22$ ,  $SD=1.176$ ), as sensory appeal was measured on a seven-point scale, ranging from 1 ('completely disagree') to 7 ('completely agree').

- Consumption intention of individuals with regard to snack vegetables offered during meetings

No main effect of vegetable presentation ( $F(1, 4)=0.441, p=0.507$ ) and no interaction effect of vegetable presentation and packaging ( $F(1, 4)=0.965, p=0.327$ ) on consumption intention were observed. Meaning that respondents in the condition in which both packaging and a mixed vegetable presentation were present did not have a higher intention to consume snack vegetables offered during meetings than the participants in the other conditions. Nevertheless, a main effect of packaging ( $F(1, 4)=7.455, p=0.007$ ) on consumption intention was found. This main effect tells that respondents in the conditions in which the snack vegetables were unpackaged, indicated to be more likely to consume these snack vegetables ( $M=7.54, SD=1.864$ ) than respondents in the conditions in which the snack vegetables were packaged ( $M=6.84, SD=2.337$ ), as consumption intention was measured on a nine-point scale, ranging from 1=('definitely not') to 9=('definitely').

- Attitude towards the amount of food that is offered

No main effects of vegetable presentation ( $F(1, 4)=3.751, p=0.054$ ) and packaging ( $F(1, 4)=0.355, p=0.552$ ) on the attitude towards the amount of snack vegetables offered were found. Also no interaction effect of vegetable presentation and packaging ( $F(1, 4)=0.824, p=0.365$ ) on the attitude towards the amount of food that is offered was observed. So, respondents in the condition in which both packaging and vegetable presentation were present did not have a more positive attitude towards the amount of food that was offered.

#### 4.2.4 Background information with regard to healthy snacking

##### 4.2.3.1 General respondents' opinions

The influence of multiple possible consumption reasons with regard to healthy snacking during meetings was checked as well. As shown in Figure 11, the included statements were natural ingredients, no additives, price, weight control, surprising snack, disturbing snack, filling snack, inappropriate snack during meetings, unhygienic and does not fit lifestyle. These items have been rated at a scale, ranging from 0 ('I totally disagree') to 7 ('I completely agree'). In here, it is important to note respondents thought snack vegetables had a natural content and helped them to control weight, they thought these snacks are expensive and it was surprising to offer snack vegetables during meetings. Furthermore, respondents did not rate snacking these snack vegetables as disturbing for colleagues, inappropriate to eat during meetings or unhygienic to eat them out of a bowl. Besides, they judged snack vegetables as a bit filling. Lastly, the relation between lifestyle and the healthiness of these snack vegetables was not a reason for respondents to not consume them.

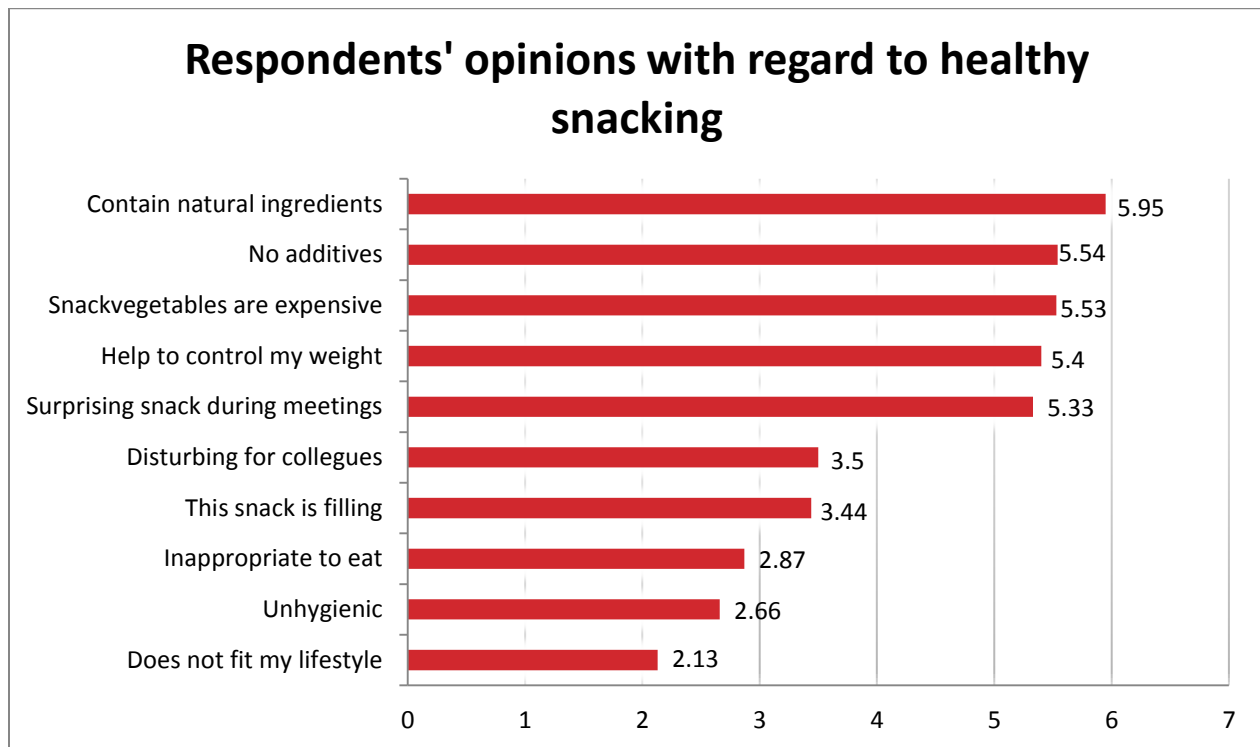


Figure 11: Bar chart with respondents' opinions with regard to healthy snacking

##### 4.2.3.2 Influence on consumption intention with regard to healthy snacking

In addition, two linear regressions were conducted, both for the condition in which a packaging was present and the condition in which packaging was absent. In these analyses, respondents' consumption intention towards the snack vegetables offered during meetings was included as dependent variable and the above mentioned ten statements as independent variables.

Both across the condition without packaging ( $F(10, 94)=8.986$ ,  $p=0.000$ ,  $R^2=0.489$ ) and the condition with packaging ( $F(10, 88)=9.714$ ,  $p=0.000$ ,  $R^2=0.525$ ) these statements were significant predictors of the consumption intention of individuals with regard to healthy snack vegetable. Either 48.9% or 52.5% of the variance in consumption intention was explained by the ten statements.

As shown in Table 9, three of these statements were significant predictors in the unpackaged condition, being 'the consumption of snack vegetables does not suit my lifestyle' ( $p=0.006$ ), 'this is a surprising snack offered at a meeting' ( $p=0.008$ ), and 'it is inappropriate to consume snack vegetables during meetings' ( $p=0.000$ ). The other statements were not significant ( $p>0.05$ ). This results in the following regression equation: consumption intention of individuals with regard to snack vegetables offered during meetings=  $-0.418 \times \text{does not suit my lifestyle} + 0.337 \times \text{surprising snack} - 0.534 \times \text{inappropriate to eat}$ . Only one statement served as a significant predictor in the packaged conditions, being 'the consumption of snack vegetables does not suit my lifestyle' ( $p=0.000$ ). All other statements were not significant in this condition ( $p>0.05$ ). This resulted in the following regression equation: consumption intention of individuals with regard to snack vegetables offered during meetings=  $-0.917 \times \text{does not suit my lifestyle}$

It could be concluded that the statement 'does not suit my lifestyle' negatively influenced the consumption intention of individuals towards healthy snack vegetables across both conditions. When respondents experienced a misfit with their lifestyle their likelihood to consume snack vegetables decreased. In the condition in which the snack vegetables were presented without packaging also the inappropriateness of offering snack vegetables during a meeting decreased the consumption intention of the respondents. When respondents considered the snack tomatoes or snack cucumbers as inappropriate to offer at a meeting, they were less likely to consume these healthy snacks. However, the surprise of these snacks increased the consumption intention of respondents. They indicated to be more likely to consume these snacks during meetings when they were surprised by these offered snacks.

*Table 9: Main effects of statements with regard to healthy snacking on consumption intention*

	Consumption intention with regard to healthy snack vegetables			
	Without packaging		With packaging	
	Unstandardized $\beta$ coefficients	P value	Unstandardized $\beta$ coefficients	P value
<b>Contain no additives**</b>	0.021	0.895	-0.387	0.055
<b>Contain natural ingredients**</b>	-0.283	0.246	0.419	0.087
<b>Help to control my weight**</b>	0.056	0.622	0.113	0.467
<b>Snack vegetables are expensive**</b>	-0.175	0.155	0.126	0.470
<b>Unhygienic to consume**</b>	0.112	0.333	0.098	0.424
<b>Does not suit my lifestyle**</b>	-0.418	0.006*	-0.971	0.000*
<b>Disturbing for my colleagues**</b>	-0.072	0.533	-0.042	0.784
<b>This snack is filling**</b>	0.201	0.065	0.009	0.947
<b>Surprising snack during meeting**</b>	0.337	0.008*	0.026	0.863
<b>Inappropriate to eat**</b>	-0.534	0.000*	-0.300	0.062

\*  $p<0.05$ .

\*\* Numbers represent mean scores on a 7-point scale.

## 5. Overall conclusion and discussion

Both across Europe and the United States the daily recommended intake of fruits and vegetables is not met (Wolf et al., 2005; Guenther et al., 2006). To stimulate the healthy snack consumption of individuals this research was conducted to get more insight in the effect of vegetable presentation (mixed vs separate), nutrition message (present vs absent), and product packaging (present vs absent) on the amount of snack vegetables consumed during meetings by meeting participants. Therefore two experiments, one field experiment and one online lab experiment, have been conducted in this paper. It was chosen to conduct the field experiment at the workplace, more specifically during meetings, as this is a new research location where a large proportion of the adult population can be reached (Sorenson et al., 2004). In addition, respondents of the online lab experiment were asked to imagine they had a meeting, so that this experiment was also focussed on the worksite of individuals.

The results of the field experiment show that the meeting attendees of the field experiment consumed on average 74 grams of snack vegetables during a meeting. But contrary to the expectations, both the way in which vegetables are presented (mixed vs separately) and nutrition message did not have a significant influence on the amount of snack vegetables consumed per person per meeting, which will be explained in the next section. As these two factors are not significantly influencing the amount of snack vegetables consumed, availability has been influential on the consumption of snack vegetables, which is in line with the literature. Consumers themselves expect an increased availability of healthy food options to be one of the most effective ways to improve healthy eating (Bos et al., 2013), which is also proven by different studies. Simply the salience and availability of a food product in general (Wansink, 2004) or more specifically of fruit and vegetables (Roe et al., 2013) turned out to figure as consumption motives for individuals. Also a larger number of snack vending machines at high schools resulted in an increased snack consumption by students (Neumark-Sztainer et al., 2005). Lastly, a study in which the availability of fresh fruit and vegetable snacks in classrooms was manipulated, found an increased consumption of these snacks. In this study baskets of fresh fruit and vegetable snacks were placed in different classrooms of the intervention school every morning. Students were allowed to eat these snacks till no more fruit and vegetables were left (Davis et al., 2009).

Both in the field experiment and the online lab experiment vegetable presentation did not significantly influence the amount of snack vegetables consumed per meeting per person or the intention of the respondents to consume these vegetables. One possible explanation might be that consumers base their judgement of vegetables and fruits liking on different characteristics compared to the judgement of unhealthy food products, such as candies. It was for example found that the product attributes taste (Brug et al., 1995) and freshness (Péneau et al., 2006) are a prerequisite for consumers to decide whether or not they want to consume healthy food products, such as an apple or vegetables. Meeting attendees might have perceived the snack vegetables as tasty and fresh looking and therefore consumed them. The presentation of the vegetables might not have been of high importance to them, which could explain why this manipulation did not have a significant influence. Besides, social influence might explain why vegetable presentation did not have a significant influence on the consumption of meeting attendees in this study. Both the presence and the behaviour of other people have a strong influence on the consumption behaviour of individuals (Herman et al., 2003; Wansink and Park, 2001). A study by Wansink and Park (2001) found the presence of others increased the consumption of individuals. This is the case because individuals are tended to mimic others. When other people smile or shake their feet during a conversation, people copy these behaviours, which is called social mimicry (Chartrand and Bargh, 1999).

During the field experiment such mimic behaviour could have taken place with regard to consuming snack cucumbers or snack tomatoes. Meeting attendees might have consumed the snack vegetables because their colleagues did or vice versa. Therefore, the manipulation vegetable presentation might have been unsuccessful. Social support might have had an important influence as well, as this was found to be a barrier for healthy consumption (Shepherd et al., 2006). Some colleagues might have been unsupportive towards the snack vegetable consumption during meetings, as they told their colleagues this consumption was disturbing for them, which was observed once during the field experiment. The online lab experiment included a question to test the effect of the and it turned out that some people thought the consumption of snack vegetables are disturbing for colleagues, as this variable scored 3.5 meaning people's opinion either disagreed a bit with this statement or were neutral. However, as one person can have an impact on the consumption behaviour of multiple colleagues this might be an explanation.

Also the presence of a nutrition message did not have a significant influence on the amount of snack vegetables consumed by meeting participants. This might be because the meeting attendees are less interested in information and health (Ragaert et al., 2004), as the respondents in this research can be classified as convenience oriented consumers. Therefore, the nutrition message promoting health might not have been influential on the consumption of meeting attendees.

The online lab experiment manipulated both vegetable presentation and packaging. Consumers generally tend to choose unhealthy snacks over healthy snacks when they have a choice between both types of snacks (Hsieh, 2004). They do so because they perceive unhealthy snacks as instantly accessible and convenient and because they associated unhealthy snacks with enjoyment, pleasure, friendship and relaxation (Hsieh, 2004; Shepherd et al., 2006). Fruits and vegetables, on the other hand, are often perceived as inconvenient by consumers. These healthy food products require preparation effort, such as careful washing or peeling, which turned out to be an important consumption barrier (Schätzer et al., 2010; Briz et al., 2008). In this study a new product innovation was tested, being snack vegetables. These snack cucumbers and snack tomatoes did not require any preparation and were easy and quick to consume.

The results of the online lab experiment show that packaging has a significant influence on convenience, sensory appeal and the consumption intention of individuals. However, contrary to the expectations, unpackaged snack vegetables were perceived as more convenient by respondents, judged as having a higher sensory appeal and resulted in a higher likelihood to consume these snack vegetables. Besides, no main effect of packaging on the attitude towards the offered amount of snack vegetables was found. Across both conditions, the consumption of snack vegetables did not require any preparation effort, such as peeling or cutting a fruit. Nevertheless, consumers in the unpackaged condition might still like to wash the snack vegetables. Due to this preparation effort, it was expected that the respondents assigned to the unpackaged condition would experience more inconvenience compared to respondents assigned to the packaged condition. However they did not, which might be because consuming the snack vegetables without a packaging is quicker, as mentioned as the second most important motivation to buy minimally processed vegetables by 22% of the Belgian consumers (Ragaert et al., 2004). The respondents in the condition in which the snack vegetables contain a package the consumers need to open this package before they can consume the vegetables inside. This takes some time and is therefore less quick compared to respondents in the condition in which packaging was absent.

Furthermore, respondents in the unpackaged condition experienced a higher sensory appeal than respondents in the packaged condition. Probably this is related to a higher perceived freshness (Péneau et al., 2006) and a better appearance (Briz et al., 2008), as these factors seem to be highly influential on the fruit consumption of individuals. To come to an evaluation of freshness consumers took taste, crispness and juiciness into account (Péneau et al., 2006), whereas appearance evaluation was based on the way the fruits looked and if the fruit pieces had rich, vivid, and attractive colours (Briz et al., 2008). These evaluations might have been more difficult when the snack vegetables contained a packaging compared to when they did not contain a packaging, which might explain the results.

Moreover, respondents in the unpackaged condition were more likely to consume snack vegetables compared to the other respondents. As mentioned earlier, the product attributes taste (Brug et al., 1995) and freshness (Péneau et al., 2006) are a prerequisite for consumers to decide whether or not they want to consume healthy food products, such as an apple or vegetables. Both taste and freshness evaluation for the snack vegetables might have been more difficult for the snack vegetables which contained a packaging compared to the snack vegetables without a packaging, which might explain these results.

Lastly, a regression analysis revealed the statement 'does not suit my lifestyle' negatively influences the consumption intention of individuals towards healthy snack vegetables across both the condition in which the snack vegetables were packaged and in which they were not packaged. In the unpackaged condition, also the inappropriateness of offering snack vegetables during a meeting decreased the consumption intention of the respondents. However, the surprise of these snacks increases the consumption intention of respondents. These differences might be explained by the visibility of the snack vegetables, as it does not really make sense respondents rate the same snack vegetables as either inappropriate or surprising when no packaging is present compared to respondents in the condition in which a packaging was present.

## **5.1 Strengths**

This research included different strengths which are related to both experiments. First of all, the research of the field experiment resulted in a large, comprehensive dataset which was gained from a real life work setting at two different ministries in The Hague. As no research regarding both healthy and unhealthy snacking has been done at meeting rooms at the worksite yet, this data was gathered at a new research location. Furthermore, a large proportion of the adult population can be reached at this location. Therefore, both a new target group will be examined and a new, real life context will be used, as employees normally consume cookies during meetings. In addition, a field experiment might be promising as the actual behaviour of people is measured during this field study and people are not able to give social desirable answers. The strength of the online lab experiment is that this research was relatively easy to control. Different statements were included and most of them were based on previously conducted research, which was helpful in examining different motives of respondents to consume snack vegetables. In addition, the total number of respondents who completed the questionnaire was large enough to examine the differences across conditions.

## 5.2 Limitations

Some limitations must be noted about both studies. A field experiment is hard to control and therefore some external influences have taken place which might have caused a change in the influence of vegetable presentation and nutrition message on the amount of snacks consumed per meeting per person. One of these limitations relates to the differences in size of the cucumbers and tomatoes. When people see a large cucumber they might take it and decide they should not eat another one. Or they can decide to take it, but they will not take a third cucumber as they do not want to eat too much cucumbers compared to their colleagues. This could have been prevented when the cucumbers were smaller.

Next to that, it was not always possible to place the decided amount of snack vegetables of 100 grams per person for each meeting, as meeting rooms were sometimes reserved for more people than the actual amount of individuals which came to the meeting or vice versa. Therefore, the amount of snack vegetables offered was sometimes a bit larger or smaller than the number of meeting attendees. Meeting attendees got either too much or too little snack vegetables offered. The same problem holds for the number of meeting attendees. Sometimes people left the meeting a bit earlier or they entered a bit later. In addition, the bowl with snack vegetables was sometimes completely empty at the end of the meeting, but it was unknown after how much time all snack vegetables were consumed. Furthermore, especially at the Ministry of Economic Affairs people were sometimes aware of the goal of the experiment. Probably this is due to their study background. The results might be influenced a bit, for example by social desirable behaviour. People might have snacked differently, because they knew they were part of an experiment and this could have stopped them from snacking.

The online lab experiment could have used better pictures for the conditions in which packaging was present. Some respondents noted it was hard to identify the content of the package. This is a problem, because it is accompanied with the fact that the distinction between separate or mixed vegetable presentation in the conditions containing packaging might not have been visible for the respondents of this study.

## 5.3 Practical implications

Despite the fact that the manipulations in the field experiment did not influence the consumption behaviour of meeting attendees, it is important to note that the meeting attendees did consume a considerable amount of snack vegetables. On average, meeting attendees consumed 74 grams of snack vegetables per meeting, which means they already meet 37% of the recommended daily amount of fruit and vegetables. Apparently, meeting attendees consumed the snack tomatoes and/or snack cucumbers just because they were offered to them. Availability is thus pivotal in this study regardless both the way in which the snack vegetables are offered (either mixed or separately) and a nutrition message (either present or absent). There is no reason to expect that people will not eat vegetables during dinner at home, as different studies on the portion size effect have proven individuals do not reduce their consumption after eating a larger portion (Rolls et al., 2004; Diliberti et al., 2004). Both after eating a larger portion of chips (Rolls et al., 2004) and a larger pasta entree (Diliberti et al., 2004) consumers did not reduce intake at dinner to compensate for the increased energy intake of their previous consumption. Therefore, this study provides potential to stimulate healthy snacking. For example food service- and vegetable companies could anticipate these findings. Such companies could offer fruits and vegetables at a broader scope of locations to fulfil the potential demand consumers have. Creating consumption moments at the workplace of employees can contribute to healthy snacking in an easy and comfortable way.

#### **5.4 Ideas for further research**

The results of the online lab experiment show that packaging had a significant influence on the consumers' intention to eat healthy snack vegetables. An interesting topic for further research would be to involve packaging in a field research. In a field experiment the content of the packaging is probably easier to see for the respondents. Visibility of these snack vegetables should be taken into account, as it is expected this was the main reason of packaging not to be significant in our study. Also the shape and feeling of the packaging should be taken into account (Ragaert et al., 2004). Besides, packaging might be a disturbing for colleagues during meetings, as opening it makes some noise. Therefore, it might be interesting to include the variable packaging in research locations in which this noise does not matter. Separated offices at the workplace, school canteens or canteens at worksites might be suitable.

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## Appendix I List to report about the snacking behaviour during meetings

	<i>registratie onderdelen</i>	<i>eenheid</i>	
	datum		
	Snackgroenten Gemengd/ Apart	G/A	
zaal	Vergaderzaal	naam/nummer	
personen	gereserveerd aantal personen	aantal	
personen	aanwezige personen	aantal	
geslacht	man	aantal	
geslacht	vrouw	aantal	
vergadering	begintijd	tijd	
	eindtijd	tijd	
schaal 1 snackgroenten	begin gewicht	gewicht	
	eind gewicht	gewicht	
schaal 2 snackgroenten	begin gewicht	gewicht	
	eind gewicht	gewicht	
schaal 3 snackgroenten	begin gewicht	gewicht	
	eind gewicht	gewicht	
schaal 4 snackgroenten	begin gewicht	gewicht	
	eind gewicht	gewicht	
aanwezig	koffie/thee	ja/nee	
koekjes	begin gewicht	gewicht	
koekjes	eind gewicht	gewicht	
snack anders	begin gewicht	gewicht	
snack anders	eind gewicht	gewicht	
lunch	broodjes	ja/nee	
lunch	begin stuks fruit	aantal	
	eind stuks fruit	aantal	
meenemen	wordt er product meegenomen	ja/nee	

externe effecten (bijv. traktatie anders)

Komen veel personen later

Gaan veel personen eerder weg

Anders, ...

Gebruik de achterkant van dit formulier als er meer dan 4 schalen met snackgroenten worden aangeboden.

## Appendix II Meeting room characteristics

Vergaderzaal	naam/nummer	
Tafel vorm	Bijv. rechthoek	
Afmetingen tafel	Lengte en breedte	
Aantal stoelen	Aantal standaard om de tafel	
Plaats snackgroenten	Bijv. midden tafel, of aparte tafel	
Plaats koffie/thee	Bijv. midden tafel, of aparte tafel	

Schets eventueel de zaal

## Appendix III Online lab experiment



Beste deelnemer,

Fijn dat u mee wilt werken aan dit onderzoek! Deze vragenlijst zal gaan over de consumptie van snackgroenten tijdens vergaderingen op het werk en zal ongeveer 5 minuten duren.

Geef eerlijk antwoord op de vragen, foute antwoorden bestaan niet. De resultaten worden anoniem verwerkt en zullen enkel gebruikt worden om meer inzicht te krijgen in consumentengedrag. Deelname is eenmalig en geheel vrijwillig.

Voor eventuele vragen kunt u mailen naar  
[Iris.vankruysbergen@wur.nl](mailto:Iris.vankruysbergen@wur.nl)

Alvast ontzettend bedankt voor uw deelname!

☒ Ja, ik ga akkoord met deelname aan dit onderzoek

>>

(Only shown when in condition 1)

Stel dat u op uw werk een vergadering heeft met meerdere collega's. Deze vergadering vindt plaats aan het einde van de middag, rond 15.00u. Tijdens deze vergadering staan de volgende snackgroenten van "Tommies" op tafel:



(Only shown when in condition 2)

Stel dat u op uw werk een vergadering heeft met meerdere collega's. Deze vergadering vindt plaats aan het einde van de middag, rond 15.00u. Tijdens deze vergadering staan de volgende snackgroenten van "Tommies" op tafel:



(Only shown when in condition 3)



Stel dat u op uw werk een vergadering heeft met meerdere collega's. Deze vergadering vindt plaats aan het einde van de middag, rond 15.00u. Tijdens deze vergadering staan de volgende snackgroenten van "Tommies" op tafel:



(Only shown when in condition 4)



**WAGENINGENUR**  
*For quality of life*

Stel dat u op uw werk een vergadering heeft met meerdere collega's. Deze vergadering vindt plaats aan het einde van de middag, rond 15.00u. Tijdens deze vergadering staan de volgende snackgroenten van "Tommies" op tafel:



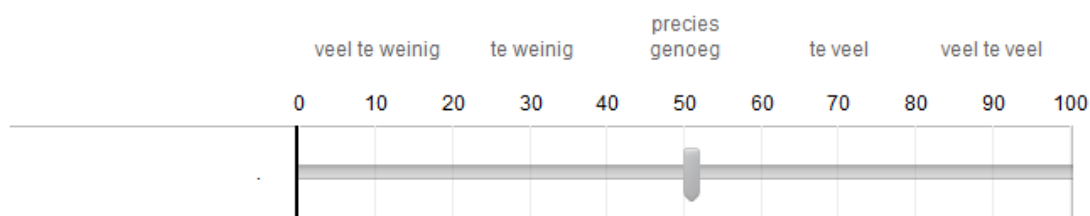
>>

Zou u deze snackgroenten eten tijdens een vergadering?

Zeker niet | ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ | Zeker wel

De schaaltes die u op de foto zag worden in een vergaderzaal voor 4 personen op tafel gezet.

Wat vindt u van de hoeveelheid die in het schaalte aangeboden wordt?



Geef aan in hoeverre u het eens bent met de volgende beweringen.

	Helemaal mee oneens	Mee oneens	Een beetje mee oneens	Neutraal	Een beetje mee eens	Mee eens	Helemaal mee eens
Deze snacks bevatten veel vitamines en mineralen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze snacks houden me gezond	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze snacks zien er lekker uit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze snacks hebben een goede structuur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze snacks bevatten geen toegevoegde geur-, kleur- en smaakstoffen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze snacks bestaan uit natuurlijke ingrediënten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze snacks bevatten weinig calorieën	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Deze snacks helpen om op gewicht te blijven	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het is gemakkelijk om deze snacks te eten tijdens een vergadering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het kost weinig tijd om deze snacks te eten tijdens een vergadering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>

Hoe vaak eet u snacktomaatjes, komkommers of soortgelijke groentesnacks?

- ☐ Nooit
- ☐ Minder dan 1 keer per maand
- ☐ 1 keer per maand
- ☐ 2-3 keer per maand
- ☐ 1 keer per week
- ☐ 2-3 keer per week
- ☐ Dagelijks

Hoe belangrijk is gezondheid voor u als u een tussendoortje wilt eten?

Helemaal niet belangrijk



Heel erg belangrijk

Geef aan in hoeverre u het eens bent met de volgende beweringen.

	Helemaal mee oneens	Mee oneens	Een beetje mee oneens	Neutraal	Een beetje mee eens	Mee eens	Helemaal mee eens
Ik houd van tomaatjes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik houd van komkommers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snackgroenten zijn duur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ik vind het onhygienisch om snackgroentes te delen met collega's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het eten van snackgroentes past niet in mijn lifestyle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het eten van snackgroentes tijdens een vergadering is storend voor mijn collega's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dit is een vullende snack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dit is een verrassende snack voor tijdens een vergadering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het is ongepast om dit te eten tijdens een vergadering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

>>

Wat is uw huidige werkstatus?

- ☐ Ik ben betaald werkzaam bij een (overheids)instelling of bedrijf
- ☐ Ik ben zelfstandig ondernemer
- ☐ Ik ben op dit moment niet betaald werkzaam

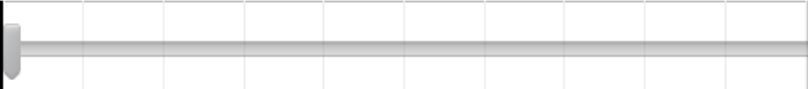
Wat is uw hoogst behaalde opleiding? Of indien u nog studeert, welke opleiding volgt u op dit moment?

- ☐ Basisonderwijs
- ☐ Lager / voorbereidend beroepsonderwijs (vmbo beroeps, lbo, lts, ito, leao, lhno, lave, huishoudschool, etc.)
- ☐ Middelbaar algemeen voortgezet onderwijs (vmbo theoretisch, mavo, ulo, mulo, ivo, vglo, etc.)
- ☐ Middelbaar beroepsonderwijs (mbo, mts, meao, mhno, inas, mis, etc.)
- ☐ Hoger algemeen voortgezet onderwijs (havo)
- ☐ Voorbereidend wetenschappelijk onderwijs (vwo, gymnasium, atheneum)
- ☐ Hoger beroepsonderwijs (hbo, hts, heao, kandidaatsopleiding, bachelor)
- ☐ Wetenschappelijk onderwijs (wo, doctoraal, master)

Wat is uw geslacht?

- ☐ Man
- ☐ Vrouw

Wat is uw leeftijd in jaren?

	16	22	28	34	40	45	51	57	63	69	75
Leeftijd											

>>

Als u nog opmerkingen heeft voor de onderzoekers, schrijf deze dan hieronder:

Heeft u interesse om vaker deel te nemen aan vragenlijsten zoals deze? Dan kunt u zich inschrijven voor het MCB universiteitspanel.

Heeft u geen interesse, of bent u al ingeschreven bij deze panels?  
Dan kunt u deze vraag overslaan.

☐ **MCB universiteitspanel**

Het MCB universiteitspanel is het panel gebruikt door de groep Markkunde en Consumentengedrag van Wageningen Universiteit. Zowel onderzoekers als PhD en master studenten voeren wetenschappelijk onderzoek uit via dit panel (niet voor bedrijven). Deelnemers aan het MCB universiteitspanel worden via e-mail uitgenodigd om deel te nemen aan onderzoek. Dit onderzoek bestaat meestal uit een online vragenlijst die u thuis kunt invullen, en soms wordt u uitgenodigd om deel te nemen aan onderzoek op locatie. Voor een deel van de onderzoeken ontvangt u een beloning, en aan anderen kunt u op vrijwillige basis deelnemen. Dit is altijd duidelijk van tevoren aangegeven. U kunt zich inschrijven voor het MCB universiteitspanel als u 18 jaar of ouder bent.

Schrijf hieronder uw e-mailadres als u zich wilt aanmelden:

**Bedankt voor uw bijdrage aan het onderzoek!**

Klik op het pijltje naar rechts om de vragenlijst in te sturen.

