Analysis of Consumer Behavior Towards Plant-Based Meat and Dairy Alternatives Market in Sweden

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Abstract

In recent years the subject of plant-based alternatives to conventional animal products has gained a lot of attention. Combining existing research with our own quantitative analysis, we are exploring what the driving factors and the barriers are, which influence Swedish consumers when it comes to consuming these specific products. In order to do this, we make use of the Theory of Reasoned Action model. The most important criteria for Swedish consumers when choosing their foods are their health and the environment, but also the taste, the traditions attached to certain foods and how their entourage influences them. The importance of our study is confirmed by the fact that first of all, the subject is quite new, most similar papers have been written in the last ten years, and not much has been written on the consumer behavior towards these products in Sweden. Moreover the study combines the existing TRA model with some new approaches to investigate the problem of acceptance of plant-based alternatives. This resolves some of the criticism that has been expressed against the standard TRA model. In our conclusion we are then able to give some advise to companies in the plant-based replacements food sector for the future.

Keywords: plant-based replacements, vegetarian, vegan, food sustainability, Theory of Reasoned Action, Swedish consumer behavior, behavioral intention gap
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1. Introduction

Currently, the human population is facing a lot of different global conflicts. Problems range from wars and unrest in different parts of the world all the way to the rising level of poverty and global warming. While a lot of the talks around global warming focus on the burning of fossil fuels (UNFCCC, 2015), one of the biggest contributors of greenhouse gas emissions is almost always overlooked (Lilliston, 2015). According to the UN (2006), in 2006 already, emissions from cattle rearing were higher than all of traffic emissions combined (FAO, 2006). Sources vary saying that animal farming is responsible for between 18% up to 35% of all CO2 emissions (UNEP 2012) or even up to 50% (Cowspiracy, 2014). Moreover farming cattle is not sustainable anymore, because more than half of the crops planted are used as feed for animals (FAO, 2006). To make room for plantations as well as new pastures for the cattle, rainforests are being cut down at an alarming rate (UNEP, 2012). All of these factors show that a big part of human food production is not sustainable anymore, and alternatives are needed in order to stop the downward spiral of environmental destruction.

One way to get a broad consumer base to cut down on their animal product consumption is to offer what is known as meat alternatives or meat replacements as well as plant-based milk and milk derivatives (Joyce et al., 2012; Baumann, 2013). The goal of these products is to mimic the taste and consistency of the animal product and make the transition to a more plant-based diet easier for new consumers (Hoek et al., 2011). Studies show that a person with a completely plant-based diet has a smaller carbon footprint than their omnivore or even vegetarian counterpart (Nijdam et. al, 2012; Baumann, 2013).

In our study, we focused on one country, Sweden, which has a rapidly growing number of vegans and vegetarians. According to a 2014 Animal Rights Sweden (Djurens Rätt) report, 6% of Swedes are vegetarian and 4% are vegan (Molloy, 2014; The Local, 2014). The survey moreover showed that a lot of Swedes are restricting their meat and dairy intake for dietary and health reasons. On the other hand, the traditional Swedish kitchen is heavily meat, cheese and fish based (Fabulous Flavours of Sweden, 2010). However, as demand fuels supply and more people opt for plant-based products, Sweden is considered an appealing country for vegetarians and vegans. From personal experience of living in Sweden for a year, we know that meat and dairy alternatives are readily available at conventional grocery stores, with
numerous Swedish brands like Oatly, Planti, Oumph and Hälsan’s Kök leading the way. An article by Radio Sweden (2015) citing Claes Salomonsson, the press officer at the wholesale food company Axfood, says that over the last year the market for plant-based milk in Sweden has seen growth of nearly a third in their sales. Euromonitor (2015) has found as well that there is a growth trend in the meat substitutes market, and that these products are not necessarily only for vegetarians and vegans. However, they are still only small players on the national processed meats and seafood market with a mere 3%. Potential help to reduce the consumption of meat may in the future even come from the government. As online articles by Ryan for “Global Meat News” (2015) and Aplin for “Forum for the Future” (2016) report, a petition started by the environmental campaign group Swedish Food and Environment Information (SMMI) to introduce a meat tax has gained over 7,000 signatures. That would make Sweden the first country in the world to introduce such a measure. Denmark had a similar tax on fat in meat and dairy products and cooking oils, but scrapped it after only a little more than a year due to high administrative costs and negative effects on local businesses (Jacobson, 2012). The goal in Sweden is to encourage people to adopt a more sustainable and environmentally friendly food consumption. We chose Sweden as the base for our study, because of its high percentage of vegetarian and vegans, as well as for its overall concern for the environment and high development. Since we are writing our thesis in Sweden, convenience was also a factor.

1.1 Research problem

In recent years, the investment in meat and dairy alternatives has been gaining popularity. Big names such as Bill Gates and the Twitter co-founders Evan Williams and Biz Stone are investing into startups focused on imitating the taste and texture of meat (Stone, 2015). Dairy alternatives exist in multiple forms, from nut milks, to soy and oats, and the same with yoghurts and cheeses (Lightowler & Davies, 1998). The market research specialist Marketsandmarkets published two different detailed market studies and projections in 2015, one on the meat substitute market and another on the dairy substitute market. According to Marketsandmarkets (2015a), the global meat substitutes market will be worth USD 5.17 billion by 2020. They are predicting a Compound Annual Growth Rate (CAGR) of 6.4%. The plant-based milk market is predicted to grow even faster (Marketsandmarkets, 2015b), at a CAGR of 15.5% to reach a value of USD 19.5 billion in 2020. Even though those numbers might seem impressive as totals, the alternatives market per country are still niche markets,
with usually only small percentages of the total market share. If we look at the vegan and vegetarian population worldwide, it is an extremely low proportion (Ruby, 2011). People who intentionally reduce their meat consumption are a little more common, but still the biggest part of the world incorporates animal products in their daily life. As previously stated, the vegetarian population in Sweden is 6% and the vegans make out 4% (Molloy, 2014; The Local, 2014).

It is a very recent topic, as 20 years ago, plant-based choices were very limited (Wansink et al., 2005). Today more and more companies (even traditional meat companies) are looking into vegetarian alternatives (Michail, 2015). Even though, the topic of plant-based replacements is quite a new one, multiple studies have been done in recent years, especially because of the potential health benefits, the growing world population and food needs as well as the heavy environmental impact of conventional animal farming. Baumann (2013) researched the different greenhouse gas emissions associated with vegan and vegetarian diets. Hoek et al. (2011) investigated how plant-based alternatives to meat and dairy are accepted among Dutch consumers. Hoek et al. (2004) furthermore studied the traits shared by consumers of these alternatives and those common to omnivores. Wansink et al. (2005) talk more about how the acceptance of especially soy-based products has been increasing in recent years. In the next chapter, the literature review analyses existing field of research in more detail.

The studies, like Marketsandmarkets (2015a, 2015b) show us that demand for plant-based products is growing and that people are taking on a more environmentally friendly lifestyle. However with a growing world population the change to more plant-based foods is not happening fast enough. Some scientists predict that until 2050 if humans continue on the same course, there could be nothing more left to fish in the sea (BBC, 2006). Rainforests plains, the size of Panama, are being cut down each year largely to make room for cattle and soy plantations to feed that cattle (National Geographic, 2016). Our study approached the problem from a marketing perspective, more precisely from the consumer behavior aspect, investigating exactly what makes people more likely to opt for the plant-based product, and what makes them leave it on the shelve for real meat and dairy.
1.2 Research question and purpose

The question we aim to answer is:

“What are the driving factors and barriers influencing Swedish consumers’ behavior towards plant-based alternatives to meat and dairy?”

In order to find an answer to our research question, we first collected secondary data, before undertaking our own qualitative and quantitative studies.

From a theoretical point of view, our paper is valuable because it will add to the research done in recent years, especially in its focus on Sweden and the growing vegan and vegetarian demand in the mostly meat- and fish-eating tradition of the nation (Fabulous Flavours of Sweden, 2010). Moreover, this study is a combination of other studies that have previously been done on related topics. As a model we used an adapted version of the TRA, Theory of Reasoned Action Model, which we will explain in more detail later in this paper.

From a practical point of view, our study is useful to companies in the meat and dairy replacement sector, because they can find the reasons, as to why their products are not yet more mainstream. It is useful for companies to know why clients buy their products, so they can put more emphasis on those characteristics, but even more importantly, companies need to know the barriers their product faces, in order to counteract them.

1.3 Research contents and framework

In the following chapters, we will first introduce some basic definitions for words often used during our research, as well as review the used literature and show how we came out with the different drivers and barriers previously identified and confirmed by our study. We then explain the Theory of Reasoned Action (TRA). Following the introduction of the basic model we go into how it was modified over time, and explain the modified version used in our research. In our method section we will explain how we went about our study followed by the analysis of our results. After a discussion, we will end with some advice for companies in the meat and dairy replacements sector.
2. Theoretical Background

2.1 Definitions: Meat and dairy analogs; Vegan, vegetarian, flexitarian

Meat and dairy substitutes exist in numerous forms today. Meat alternatives traditionally are plant-based processed products, which are supposed to imitate the taste of meat, while also being a source of protein, instead of the meat (Elzerman et al., 2013). In the last years a lot of effort has been put into making the fake meat look and taste exactly like animal meat. Most of the products are soy or wheat based (ibid). While forty years ago, the only option for vegetarians was tofu, they can today choose from a multitude of flavors and ingredients (Elzerman et al., 2013).

Dairy alternatives have been growing in recent years as well. Not only vegans fuel this trend, but also a number of people, that are still eating meat, are leaving milk on the shelves due to the health impact or lactose intolerance (Wansink & Westgren, 2003). Dairy alternatives are mostly made either of soy, nuts or oats (Lightowler & Davies, 1998). The possibilities here are endless, from almond over hazelnut, to coconut and rice milk (ibid.). Companies have started to branch out into dairy derived products as well. Now you can find plant-based cheese, yoghurt and cream in many supermarkets (Lightowler & Davies, 1998).

A vegan is a person, who does not consume any products derived from animals. This encompasses meat, fish, dairy, eggs and honey. This also means no baked products for example, where eggs and dairy were used, as well as no dairy derived products, like yoghurt or cheese. Very strict vegans will also pay attention to vegan alcohol (Appelby et al., 1999).

Vegetarianism exists in different forms. The traditional definition is for ovo-lacto-vegetarian, meaning a person does not eat meat or fish, but still consumes eggs and dairy (Appelby et al., 1999; Hoek et al., 2004). The variations can be lacto-vegetarian, which means no meat, fish or eggs, or the ovo-vegetarian, who doesn’t eat meat, fish or dairy (Freeland-Graves et al., 1982).

Flexitarians eat everything, but consciously reduce the amount of animal products they consume, for various reasons, be it diet, environmental or ethical (Freeland-Graves et al., 1982). Omnivores consume both, animal- and plant-based products on a regular basis.
It would be wrong to just assume that all vegans and vegetarians are heavy users of meat and dairy alternatives. In a previous study done by Hoek et al. (2011) on Dutch consumer’s acceptance of replacement products, they do not go into that aspect very much. There is a whole movement in the vegan and vegetarian community that wants to avoid processed foods all together, as much as possible. That means that those consumers prefer to cook all of their meals from scratch, only using whole foods and so would fall into the category of non-users or light-users of meat and dairy alternatives. Furthermore it would also cancel out the hypothesis that all consumers go from non-user over light-user to heavy user, like their study suggests. A lot of vegans and vegetarians might use those products as a phase to abandon animal products and then go on to abandon processed foods as well. Knowing this, heavy-users of meat and dairy alternatives might actually be just as many flexitarians for example as vegans and vegetarians (Hoek et al. 2004). Omnivores as well might occasionally shop these products to reduce their animal product intake. Dairy and meat alternatives in that case might be seen more as a transition product from animal to plant-based. Of course a lot of vegans and vegetarians will stay with the replacement products and not abandon them.

2.2 Literature review

Multiple studies and researches have been done on the subject of meat & dairy replacements, as well as on the closely related subject of consumer acceptance of organic products. Hoek et al. (2011) have done a study of Dutch people’s attitude towards meat and their plant-based replacements. That study also analyzed consumer behavior and found out which are the drivers and barriers for these particular products. They found that mostly people do not like the taste of the plant-based food, or they haven’t even tried it, because of “food neophobia”\(^1\). All the people who are more reluctant to try these products have shown to possess other priorities than for example health or the environment. Hoek et al. (2011) show that currently the barriers for the replacement products are still very high. The drivers were mostly a concern for animals, a desire to lose weight or live healthier and more environmentally friendly. Hoek et al. (2004) moreover found out, that ways of shopping, quality aspects, cooking methods, consumption situations and purchasing motives are the main differences

\(^1\) a fear of new, unknown foods. Measured by the food neophobia scale (FNS) first defined by Pliner & Hobden (1992)
between vegetarians and meat consumers towards food-related lifestyle attitudes. Plus, vegetarians prefer to shop in specialty shops and buy ecological products. They read product information labels and are more interested in new products and recipes.

In the same line of buying ecological and more environmentally friendly products, Elofsson et al. (2014) and Vermeir & Verbeke (2006) explored the so-called attitude-behavioral intention gap. Elofsson et al. (2014) explored if the sale of more sustainable milk would go up, after they put a sustainability sign next to that milk. The sales did in fact go up, but much less than surveys about consumers’ intentions would have suggested. Vermeir & Verbeke (2006) came to a similar conclusion, also while researching consumer dairy choices. While consumers might in surveys answer that they pay attention to eco-friendly and sustainable products, in the shop, the final decision is subject to a lot of other factors as well, like price, brand or packaging. This results in lower increases of consumption of eco-friendly products, than previous surveys would have suggested. However both studies do come to the conclusion that intentions and behavior are still correlated, although not perfectly aligned. Even if those studies were about sustainable milk, the problem is similar with meat and dairy replacements, because these are also more bearable alternatives to the conventional animal products.

Wansink et al. (2005) wrote a relevant paper on the barriers to the acceptance of soy-based products today. The ties can be made back all the way to the Second World-War. As the shortages of meat were rising, the governments wanted people to use other sources of protein than meat. The introduction of soy-based foods into people’s diets was encouraged. However, the soy products at that time were not very tasteful. That prejudice against soy-based products is still around today and is a major barrier to their increase in popularity. Wansink et al. (2005) also talk about the important role of the gatekeeper, the person in a household who decides what to purchase. Traditionally, it used to be the woman (mother), but as more women have children and continue to work, the role of gatekeeper shifts to the rest to the family as well. Thus, in order to appeal to a broader customer-base, meat alternatives have to be attractive to children as well as their parents. The role of the gatekeeper will also be factored in this study. It is important when it comes to knowing to which consumer the product has to appeal and who is the person with potential opposition to the analog product.

Pohjolainen et al. (2016) came out with an interesting addition to the behavioral intention gap, concentrated on meat production. They question, whether most customers even bring meat in
relation to climate change and rising greenhouse gas emissions. The study was done by survey of about 4000 Finns. The result is that only about 36% of respondents made the connection between the sustainability issue and meat. Interestingly, 47% were neutral, they did not know. It shows, that more than the behavioral intention gap, another problem with animal production, is that a lot of customers do not make the connection to unsustainability. That is why we integrated questions about consumers’ knowledge about the sustainability issue into our questionnaire as well.

2.3 Theory of Reasoned Action (TRA)

We chose to use the TRA model to conduct our study. Previous theses on the acceptance of organic food have been done using TRA as well (Li & Xin, 2015; Myresten & Setterhall, 2015; Padel & Foster, 2005) and it is one of the most widely used models in consumer behavior research (Petrovici et al., 2004). The subject of organic food is closely related to plant-based food, in that it is healthier and more sustainable than the conventional product (Li & Xin, 2015; Myresten & Setterhall, 2015; Baumann, 2013).

In two previous studies (Myresten & Setterhall, 2015; Li & Xin, 2015), the principle of Theory of Reasoned Action (TRA) was used. TRA is a concept first presented by Fishbein and Ajzen in 1975. The basic model that they came up with is that a consumer’s behavior intention, which is closely related to behavior, is influenced by a person’s attitude and subjective norm. Those two factors are independent from each other and if they are positive, a person’s intention to purchase increases. This means, if a person’s attitude and entourage towards a certain product is positive, that person will be more likely to purchase said product.
The following formula relates those factors (Ajzen & Fishbein 1980):

\[ B \approx BI = A_{act} (\omega_1) + SN (\omega_2) \]

Where:
- B is a specific behavior
- BI is the intention to engage in that specific behavior
- A_{act} is the personal attitude towards engaging in that specific behavior
- SN is the subjective norm; it tells us whether the entourage of a person wants them to engage in that specific behavior.
- \( \omega_1, \omega_2 \), are the weights reflecting the relative influence each factor has on the behavior intention (BI).

The formula assumes that behavioral intention (BI) is the strongest predicting variable for actual behavior (B) and so they are almost equal. In the second part of the equation we find the factors that influence behavior intention, the attitude and subjective norm. The weights are what we calculated in order to find out how much these two factors influence a consumer’s behavior intention.

![Diagram](image)

*Figure 1: The basic TRA model as defined by Aijzen & Fishbein (1980)*

Figure 1 is a visual representation of the basic formula that Aijzen and Fishbein developed in 1980. It shows the two separate factors attitude and subjective norm influencing behavioral intention, which in turn directly influences actual behavior. In order to make our study possible, we do not take into account any possible feedback, meaning how behavior can in turn possibly influence attitude or subjective norm. We are also not taking into account what certain researchers referred to as the “Crossover Effect”, which suggests, that the two factors attitude and subjective norm may be interdependent (Oliver & Bearden, 1985).
2.3 Behavior

Behavior is defined as “[...] observable acts that are studied in their own right” (Fishbein & Ajzen, 1975; p. 335). The behavior that we are analyzing is the act of purchasing meat and dairy replacement products in a store at a specific time.

2.3.2 Behavior intention

BI is defined as “[...] a person’s location on a subjective probability dimension involving a relation between himself and some action. A behavioural intention, therefore, refers to a person’s subjective probability that he will perform some behaviour” (Fishbein & Ajzen, 1975; p.288). According to the TRA model, if BI is positive, that makes a certain behavior very likely. Our hypothesis consequently is as follows:

**H1**: A person’s behavior intention to buy meat and dairy replacement products has a strong positive relationship to their actual behavior of buying those products.

H1 can be expressed with Equation 1:

$$B = BI(\omega_1)$$

Where:

B is a specific behavior

BI is the intention to engage in that specific behavior

$\omega_1$ is the weight reflecting the influence behavior intention has on behavior

2.3.3 Attitude

Attitude was defined by Fishbein & Ajzen as “[...] a person’s general feeling of favourableness or unfavourableness toward some stimulus object” (1975; p.216). When asking questions about attitude, three components have to be respected. Attitude is about a person’s personal belief that a certain action will lead to a desired outcome. In the notion of our study, that would be for example a person’s belief, that consuming meat & dairy replacements is good for their health. In order to study the factor attitude, we have identified five different variables: health, taste, animal welfare, environmental friendliness and a positive feeling when consuming the product. We chose health because of all the different studies that came out in recent years about the toxins and carcinogens in processed meats, as
well as antibiotics and hormones in animal foods and the mounting evidence that a plant-based diet is healthier (Springmann et al., 2016; Tuso, 2013; Anomaly, 2015). We chose taste because of Wansink et al. (2005) and Hoek (2011), both saying that sensory appeal is a main issue for consumers when considering to switch to analog products. Environmental friendliness was chosen, because as we established in the introduction, animal production is a massive burden on the environment (FAO, 2006; UNEP 2012). Animal welfare is obvious, considering that no animals have to be harmed to produce plant-based foods. Moreover, the evidence of animal mistreatment on factory farms has been growing in recent years (Anomaly, 2015). Lastly, we decided to include the factor of feeling good to encompass all of the emotions above and describe a consumer’s feeling, that they took a more ethical choice than the conventional product. These variables were considered because previous research indicated they are factors influencing people’s choice regarding meat replacements and they were used by Myresten and Setterhall (2015) in their paper using the TRA model to study consumer behavior towards organic products. Our hypothesis for attitude is thus as follows:

H2: A consumer’s attitude towards meat and dairy replacement products has a positive relationship towards their intention of buying those products.

2.3.4 Subjective Norm

Subjective norm is defined as “[...] a person's perception that most people who are important to him or her think he or she should or should not perform the behavior in question” (Fishbein & Ajzen 1975; p. 302). This means that, when measuring SN, we firstly need to know what other people think of a certain action, in our case the consumption of plant-based meat and dairy analog products, secondly how important these opinions are to the actor in question and thirdly, how many different groups of people there are influencing the actor. We grouped the people influencing an actor into three categories, according to Myresten and Setterhall (2015): friends, family and classmates/colleagues. These three variables together constitute the subjective norm. If the people are favorable to a certain action (in our case buying replacement products) and if that opinion is important to the actor, it will positively influence behavioral intention. This makes our next hypothesis as follows:

H3: A consumer’s subjective norm towards meat and dairy replacement products has a positive relationship towards their intention of buying those products.
2.3.5 Background

In our paper, we use the term background to refer to the socio-economic background of a person. Although, Ajzen and Fishbein (1980) did not include background as a factor in their model, they did say that gender, age and occupation do indirectly influence behavioral intention. Li and Xin (2015) and Myresten and Setterhall (2015) included background factors into their studies, as well as, Greene-Finestone et al. (2008), who found that more female adolescents than male adolescents were vegetarian, when they did their study in the UK and the Netherlands. In line with the theory, we also incorporated background factors gender, age and occupation into our hypotheses:

**H4:** A person’s socio-demographic background (age, gender, occupation) indirectly influences their intention to buy meat and dairy replacement products.

In order to incorporate hypothesis 4 into the existing simple formula developed by Ajzen and Fishbein (1980) we came up with a new equation that will be referred to as Equation 2 in the rest of our paper. **Equation 2** consists of our hypotheses 2, 3 and 4.

\[
B \sim BI = Aact (\omega_1) + SN (\omega_2) + Gender (\omega_3) + Age1 (\omega_4) + Age2 (\omega_5) + Age3 (\omega_6) + Age4 (\omega_7) + Age5 (\omega_8) + Age6 (\omega_9) + Occupation1 (\omega_{10}) + Occupation2 (\omega_{11}) + Occupation3 (\omega_{12}) + Occupation4 (\omega_{13})
\]

The different variables that we determined for gender, age and occupation are called dummy variables. “A dummy variable is a binary variable that can take only two values, 0 and 1. It is often used in the regression model to incorporate qualitative (categorical) explanatory variables[…].” (Erjavec, N., 2011; p. 407). As the detailed explanation for our equation would have been quite extensive, we included this in Appendix 3.

2.4 Expansion of the TRA model

2.4.1 Background

After reading through other similar studies, like Li & Xin (2015) or similar consumer research studies, like Liu (2013), which focused on online group buying behavior in China, we decided to expand our background factors, to include not only gender, age and occupation, but also income and education. We thought these factors were important as well, because firstly
replacement products are often priced higher than the animal factor. This makes income a potential influence on a person’s behavior intention. Secondly, we are analyzing their behavior in relation to the environmental impact, so their education plays a factor. In the end we took inspiration from many different studies when we decided on the background factors. We decided to follow Hoek et al.’s (2004) idea which was based on Freeland-Graves et al. (1986); Jabs et al. (1998) and Perry et al. (2001), and we chose: gender, age, gross education level, gross household income, and occupation as variables for our study. This was also done in the same way in Li & Xin’s work (2015).

**H5:** Besides age, gender and occupation, a person’s socio-demographic factors of income and education indirectly influence their intention to buy meat and dairy replacement products.

From this hypothesis we came out with the following **Equation 3**:

\[
B \sim BI = A_{act} (\omega_1) + SN (\omega_2) + \text{Gender} (\omega_3) + \text{Age1} (\omega_4) + \text{Age2} (\omega_5) + \text{Age3} (\omega_6) + \text{Age4} (\omega_7) + \text{Age5} (\omega_8) + \text{Age6} (\omega_9) + \text{Occupation1} (\omega_{10}) + \text{Occupation2} (\omega_{11}) + \text{Occupation3} (\omega_{12}) + \text{Occupation4} (\omega_{13}) + \text{Income1} (\omega_{14}) + \text{Income2} (\omega_{15}) + \text{Income3} (\omega_{16}) + \text{Income4} (\omega_{17}) + \text{Income5} (\omega_{18}) + \text{Income6} (\omega_{19}) + \text{Education1} (\omega_{20}) + \text{Education2} (\omega_{21}) + \text{Education3} (\omega_{22}) + \text{Education4} (\omega_{23}) + \text{Education5} (\omega_{24}) + \text{Education6} (\omega_{25})
\]

In Equation 3 we used dummy variables again to incorporate our categorical variables for gender, age, occupation, income and education. The complete explanation of the equation is included in Appendix 3 under Equation 3.

### 2.4.2 Barriers

TRA is one of the most used models in psychology and consumer behavior research (Oliver & Bearden, 1985), however it has previously come under some criticism for its simplicity (Aleassa et al., 2011; Trafimow, 2009) and for not including enough influential factors (ibid.). Moreover one criticism is, that behavioral intention is not a proxy of actual behavior (Kollmuss & Agyeman, 2002) and there are more factors influencing a person’s decision. As we discussed above, Vermeir and Verbeke (2006) and Elofsson et al. (2014) also studied the fact, that intention and behavior are not identical. That is why we decided to use a modified version of TRA as presented in Li & Xin’s work (2015). First of all, this model does take a
person’s background into consideration, which can influence their intention and final behavior. It also makes a difference between intention and actual final behavior. Between intention and behavior there are different variables, called barriers, which are not covered in the two factors attitude and social norm. They explain the fact that sometimes people might have the intention to do something, like reduce their meat consumption, because they like animals or care for the environment, but their actual decision in the grocery store or restaurant is different.

Figure 2: Revised TRA adapted from Li & Xin (2015)

Figure 2 incorporates the new factor barriers as well as the previously established factor background into the existing TRA model.

The barriers can be a multitude of things that stop people, after they have taken the positive decision of buying a certain product, from actually buying it. From Hoek et al. (2011) we included the barriers of price and food neophobia. From Wansink et al. (2005) we included the gatekeeper barrier, as well as the cultural barrier. From Kollmuss and Agyeman’s work (2002) we included the availability and information barrier. Price was included, because plant-based replacement products are often more expensive than the conventional one. Food neophobia was really significant in Hoek et al.’s (2011) study, as a lot of the replacement products are new on the market and unfamiliar to consumers. Because of the meat and dairy based Swedish kitchen, we also used the cultural barrier proposed by Wanksink et al. (2005). Since the replacement product market is growing and new products are coming out, we included information and availability as barriers, because people might not know about all the options, or if they are available at regular stores. Our qualitative study confirmed that these are the main barriers for people after they had the intention of buying a certain product. As it
is clear from the visual representation of the model, the barriers represent the difference between BI and B. In form of a hypothesis this would look as follows:

**H6a**: The cultural barrier (CB) has a positive influence on the gap between behavioral intention to buy meat and dairy replacement products and actual behavior.

**H6b**: The gatekeeper barrier (GB) has a positive influence on the gap between behavioral intention to buy meat and dairy replacement products and actual behavior.

**H6c**: The information barrier (IB) has a positive influence on the gap between behavioral intention to buy meat and dairy replacement products and actual behavior.

**H6d**: The availability barrier (AB) has a positive influence on the gap between behavioral intention to buy meat and dairy replacement products and actual behavior.

**H6e**: The price barrier (PB) has a positive influence on the gap between behavioral intention to buy meat and dairy replacement products and actual behavior.

**H6f**: The food neophobia barrier (FNB) has a positive influence on the gap between behavioral intention to buy meat and dairy replacement products and actual behavior.

Our final **Equation 4** explores the gap between behavior intention and actual behavior, encompassing all of the six barriers. **Equation 4** is the following (explanations in Appendix 3):

\[
BI - B = CB (\omega_1) + GB (\omega_2) + IB (\omega_3) + AB (\omega_4) + PB (\omega_5) + NB (\omega_6) + \text{Gender} (\omega_7) + \text{Age1} (\omega_8) + \text{Age2} (\omega_9) + \text{Age3} (\omega_{10}) + \text{Age4} (\omega_{11}) + \text{Age5} (\omega_{12}) + \text{Age6} (\omega_{13}) + \text{Occupation1} (\omega_{14}) + \text{Occupation2} (\omega_{15}) + \text{Occupation3} (\omega_{16}) + \text{Occupation4} (\omega_{17}) + \text{Income1} (\omega_{18}) + \text{Income2} (\omega_{19}) + \text{Income3} (\omega_{20}) + \text{Income4} (\omega_{21}) + \text{Income5} (\omega_{22}) + \text{Income6} (\omega_{23}) + \text{Education1} (\omega_{24}) + \text{Education2} (\omega_{25}) + \text{Education3} (\omega_{26}) + \text{Education4} (\omega_{27}) + \text{Education5} (\omega_{28}) + \text{Education6} (\omega_{29})
\]
2.5 Theory summary

The points mentioned above present the different factors that influence consumers’ behavior towards meat and dairy alternatives. First of all, many consumers have food neophobia (Hoek et al., 2011), which means that they have an aversion towards trying new foods. Moreover, when plant-based alternatives entered the market, they did not taste well, and people remember that (Wansink et al., 2005). The gatekeeper in families is also changing, and companies have to adapt (ibid.). Furthermore the so-called attitude-behavioral intention gap presents a barrier, because even if people associate meat with negative environmental effects, they will factor in multiple other things, like price, taste and availability before buying the plant alternative (Vermeir & Verbeke, 2006). Finally, there are a lot of consumers that do not even make that connection between sustainability and animal farming (Pohjolainen et al., 2016). On the other hand, the drivers are that people are starting to pay more attention to their health and the environment (Hoek et al., 2004). News is coming out of the damaging effects of animal farming to the environment (FAO, 2006) and people’s awareness, especially in highly developed countries like Sweden increases. Through the TRA model, we will study how each of these factors influences people and we will then be able to give useful advice to companies in the replacements sector. We started from the original TRA model conceptualized by Ajzen and Fishbein (1980), but added more background variables. Finally we came up with our own model in order to test the influence of barriers on the gap between behavioral intention and final behavior, an aspect which Ajzen and Fishbein have been criticized for neglecting.
3. Research Method

3.1 Research design

The aim of the study was to identify the different drivers and barriers towards plant-based meat and dairy alternatives from a consumer behavior point of view. The method we used was explanatory sequential design, according to the guidelines described by Bryman and Bell (2011; p.647). This means that we used a qualitative study as preparation for our main quantitative study. The qualitative study was performed in form of a semi-structured interview with a focus group. This was done with two different goals: first of all, to test if the factors that previous researchers have come up with apply to Swedish consumers and furthermore, to check whether there are any additional factors influencing people that other sources had not analyzed yet. Those results were then transferred into our main study, the consumer survey.

With our questionnaire we wanted to test all the variables previously established and find out which ones actually have a significant influence on Swedish consumers when they decide whether to buy the conventional animal product, or the plant-based substitute.

3.2 Qualitative study

3.2.1 Preliminary efforts

We decided that we wanted to have some qualitative studies in the form of interviews and/or focus groups, before concentrating on our main study, of quantitative nature carried out through a survey. As we wanted both sides in the qualitative study, we were planning a focus group interview with Swedish consumers, as well as interviews with Swedish companies in the plant-based replacements sector. We contacted several Swedish companies in the meat & dairy analog market and asked them for input. The responses were very slow and we only got a reply from two Swedish based companies, both in the dairy analog market, but after an initial favorable answer, they became unresponsive again, due to time restraints, as they said. In the end we did not manage to get an interview with a company on their views about consumer acceptance factors of their products.
3.2.2 Focus Group

We did get the consumer point of view in form of a focus group interview. Our qualitative study was purely exploratory as it is defined in Saunders et al. (2009; p. 139). This means, we did not have any expectations or hypotheses, but were trying to get new information from the respondents. As previously mentioned, we made use of the focus group method for this part. The goal was to find all the factors influencing people on the subject of meat & dairy replacements. This would later allow us to come out with a set of hypotheses that we wanted to test in the following quantitative study. This method of using the qualitative data to facilitate our quantitative research was done according to Bryman and Bell (2011; p. 649). Hoek et al. (2004) had already found some general factors, like price and availability, Hoek et al. (2011) came out with food neophobia, as well as health, animal welfare and the environment. We wanted to go into more detail by using the focus group. This technique is very well designed to find out specifics, because in a focus group the questions are open and allow for elaborate answers from the subjects. Moreover, there is much more time and the interviewers can go into more detail where they feel it is necessary, steering the conversation and discussion. (Saunders et al., 2009; p. 139).

3.2.3 Sampling and data collection

For the focus group, we decided to try and get a broad spectrum of people. We managed to get a group together of 5 subjects, 2 females and 3 males. They were between the ages of 23 and 75 and from different educational backgrounds. We had a meeting of about 40 minutes face to face. They did not get any advance interview sheets; they just knew that it was about meat and dairy alternatives. We prepared the meeting by buying some products, soy cream cheese and sliced cheese as well as real Gouda. We also had oat milk, real milk and some plant-based ham. We put the cheese and meat on white bread and poured the milk into the coffee before the respondents arrived and then asked them to taste-test and find out which is the real animal product and which ones are plant-based. While they were taste testing, we introduced the subject and our thesis in more detail before going through the questions, we had previously written down (Appendix 1). The interview was semi-structured as advised in Bryman and Bell (2007; p. 474) and tape recorded, also advised by Bryman and Bell (2007; p. 489), for later evaluation.
3.2.4 Results

The interview was a success. All five people responded elaborately to our questions, nobody was silent for too long and everybody expressed their opinions. By chance, we had a sample of five people who were quite aware of the environmental dangers of animal farming. Four of them ate vegetarian at least two to three times a week. We also noticed that the respondents made a clear difference between dairy and meat. For example they ate meat only two to three times a week, but milk and cheese every day. Following this point, we discussed if we should separate meat & dairy and their replacements, but we argued it would make the study and the questionnaire too long and complicated, with a whole set of new variables. Additionally, a lot of the companies that are in the replacement market are in the plant-based dairy and meat products together. We will talk about our findings from the focus group in detail in the next chapter. The main elements from our focus group interview that we incorporated into our survey were the importance of taste, as well as the traditional aspect of food. We also consciously asked about monthly income, because, as one respondent pointed out, for him the price was only a secondary issue as he is a member of a comfortable middle-class urban family. They can afford to put quality above price in their priorities list. We also noticed, that even though they were aware of the effects of animal farming on the environment, they put personal comfort as more important and only moderately changed their eating habits.

3.3 Quantitative study

Additionally to our qualitative study, we did a quantitative analysis to get a large amount of data. In this part we used a deductive approach, one of the methods proposed by Bryman and Bell (2007; p. 28) for quantitative studies. A deductive approach is taken when researchers want to test a theory. This applied to our case, as we had already stated our hypotheses in the theory section and wanted to test them through our quantitative study. To collect our data, we used a survey. The goal was to find out what motivates customers to buy meat and dairy alternatives and what barriers increase the gap of customers’ behavior intention and their actual behavior. “A quantitative study is a data collection technique that generates or uses numerical data.” (Saunders et al., 2009; p. 151). We made use of it in order to get a comprehensive understanding of Swedish consumers’ behavior towards meat and dairy alternative products. The questionnaire was structured, with a few single answer questions to get background information at the beginning and the end. Most of the questions were matrix questions, where respondents were asked to rank a certain statement from 1 to 7 according to
the Likert scale. This made it possible for us later to attribute weights ($\omega$) to each one of our factors. Our survey was inspired very much from Myresten & Setterhall’s (2015) work, which used the TRA model to investigate people’s behavior towards organic foods. The following parts explain our questionnaire in detail.

3.3.1 Sampling & Data collection

As it was not possible for us to survey the entire Swedish population on the subject, a sample was necessary. It was discussed, putting the questionnaire up online for people to fill out, or conducting the interviews face to face. In the end, we decided to put the questionnaire up online to get our friends living in Sweden to answer it, but to get a more diverse population we would also go to public places and ask people of all ages if they wanted to participate. This means that we used a combination of self-selection sampling (Saunders et al., 2009; p. 241), for the people who decided to take our online questionnaire, as well as snowball sampling (Saunders et al., 2009; p. 240), because we asked our friends to forward the questionnaire to their friends, and convenience sampling (Saunders et al., 2009; p. 241) for the people that we selected by chance in public places. The data was collected online through the free survey program “Survey Hero”. After collection, the Survey Hero site enabled us to download all the data in form of an excel file.

3.3.2 Operationalization

The following Table 1 shows exactly, how we operationalized each of the factors that we discussed in theory section. Every hypothesis was put into question form. The factors and their relative weights are given values ranging from 1 to 7 on the Likert scale.
### Table 1: Questionnaire development process

<table>
<thead>
<tr>
<th>Existing TRA variables</th>
<th>Proposed by authors</th>
<th>Explanation of variables in accordance to authors</th>
<th>Question number</th>
<th>Examples of questions translated from each variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Intention</td>
<td>Fishbein &amp; Ajzen (1975; p.288)</td>
<td>“Behavioural intention refers to a person’s subjective probability that he will perform some behaviour.”</td>
<td>Question 7</td>
<td>How often do you plan on consuming meat &amp; dairy replacement products in the future?</td>
</tr>
<tr>
<td>Behavior</td>
<td>Fishbein &amp; Ajzen (1975; p.335)</td>
<td>“A specific behaviour is defined as observable acts that are studied in their own right”</td>
<td>Question 5</td>
<td>How often do you consume meat &amp; dairy replacement products in an average month?</td>
</tr>
<tr>
<td>Attitude</td>
<td>Fishbein &amp; Ajzen (1975; p.216)</td>
<td>“An attitude represents a person’s general feeling of favourableness or unfavourableness toward some stimulus object”</td>
<td>Question 8</td>
<td>I think consuming meat &amp; dairy replacements is good for my health. The fact that meat &amp; dairy replacements are good for my health is important to me.</td>
</tr>
<tr>
<td>Subjective Norm</td>
<td>Fishbein &amp; Ajzen (1975; p.302)</td>
<td>“The person’s perception that most people who are important to him or her think he should or should not perform the behaviour in question.”</td>
<td>Question 9</td>
<td>My friends think I should consume meat &amp; dairy replacements. What my friends think about my consumption is important to me.</td>
</tr>
</tbody>
</table>

#### Added Barriers

<table>
<thead>
<tr>
<th></th>
<th>Proposed by authors</th>
<th>Explanation of variables in accordance to authors</th>
<th>Question number</th>
<th>Examples of questions translated from each variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>Hoek et al. (2011); Kollmuss (2002)</td>
<td>a person’s likelihood of buying a certain product, depending on the price.</td>
<td>Question 10</td>
<td>Meat &amp; dairy replacements are too expensive. Expensive products make my purchase more unlikely.</td>
</tr>
<tr>
<td>Availability</td>
<td>Wansink et al. (2005)</td>
<td>availability of the certain product meant for consumption</td>
<td>Question 10</td>
<td>Meat &amp; dairy replacements are not easily available at my regular grocery store. The poor availability of meat &amp; dairy replacement in the grocery store make my purchase more unlikely.</td>
</tr>
<tr>
<td>Information</td>
<td>Wansink et al. (2005); Kollmuss (2002)</td>
<td>information about a certain kind of product</td>
<td>Question 10</td>
<td>Information about meat &amp; dairy replacements is difficult to access. The accessibility of information about meat &amp; dairy replacements makes my purchase more unlikely.</td>
</tr>
<tr>
<td>Gatekeeper</td>
<td>Wansink et al. (2005)</td>
<td>the person in a household who makes the decision about what is consumed</td>
<td>Question 10</td>
<td>I cannot decide freely over what I consume in my household. Not being able to decide freely over what I consume in my household makes my purchase of meat &amp; dairy replacements more unlikely.</td>
</tr>
<tr>
<td>Food neophobia</td>
<td>Hoek et al. (2011); Pliner &amp; Hobden (1992)</td>
<td>a fear of trying new, unknown foods, measured with the food neophobia scale (FNS)</td>
<td>Question 10</td>
<td>I don’t like to try new foods. The fact that I don’t like to try new food makes my purchase of new products more unlikely.</td>
</tr>
<tr>
<td>Traditions</td>
<td>Hoek et al. (2011); Focus group</td>
<td>connecting known foods with culture and traditions around it, connecting food with craftmanship</td>
<td>Question 10</td>
<td>I value the cultural and traditional aspect of food. The traditional aspect of food makes me more inclined to purchase.</td>
</tr>
</tbody>
</table>
Background

Question 1, 3 and 11 through 17 were about people’s background. We combined questions that Myresten & Setterhall (2015) asked as well as questions we found in Li & Xin’s (2015) work, to be sure to include all the factors that could influence people. Income and weekly spending was important, because replacements are mostly more expensive than the traditional product. Education was important, because we linked the consumption of alternative products to environmental knowledge. The household question could later be linked to the barrier of making own decisions when it comes to grocery shopping.

3.3 Testing

After we finished the questionnaire, we pretested it. Therefore, we used people close to us, to get honest feedback. Six people pretested the survey, 4 females and 2 males. 4 of them were students and 2 working. 3 respondents were between 25-30, 2 between 20-25 and 1 between 15-20. We sent it to some people not involved in business studies, to find out if the questions are easily understandable and if there is a logic that respondents can pick up on so that they don’t feel confused about the type of questions we are asking. We also sent it to 2 students from current or former business studies to see if they think that we have asked all the important points we needed to find out, as well as if we would be able to get significant results out of our survey. The feedback was very valuable. The text at the beginning was only added after a PhD student suggested us to do that. We also fine-tuned some of our questions and changed the structure of the survey. After taking all the advice, we put together the final version of our questionnaire, which we sent out to people. As our friends were very responsive, the pilot study only took us one day. In our first draft, we also did not include the option “I don’t know” as another option to ranking the environmental impact from 1-7 on the Likert scale.

3.3.4 Data Transformation

In our survey, we used the seven point Likert-scale and the scope of our raw data was from 1 to 7, for both assertion answers and weighting answers, except for B and BI, which only had assertion answers. Each variable’s assertion answer was re-coded from -3 to +3 in SPSS, so as to strengthen negative or positive answers. Hence the answers were coded into numbers ranging from -3 (strongly disagree) to +3 (strongly agree). Following the recommendations
from Fishbein and Ajzen (1975; 1980), each variable’s weighting answer was left with original scope from 1 to 7.

The next step was pairing two questions together, the assertion question (e.g. I think consuming meat & dairy replacements is good for my health) and the weighting question (e.g. The fact that meat & dairy replacements are good for my health is important to me). Their values are multiplied into one item by SPSS. This gave us combined results on a scale ranging from -21 to 21, since the assertion answers had been re-coded from -3 to +3 and the weighting answers were maintained from 1 to 7.

3.3.5 Statistical Tests Choice

The collected data was analyzed using SPSS statistical software:
1. We used descriptive statistics of SPSS for the demographic distribution.
2. We used reliability analysis of SPSS to test the internal consistency of the attitude scale and subjective norm scale.
3. We used factor analysis of SPSS to test the construct validity of the attitude scale and subjective norm scale.
4. We used regression analysis to test the hypotheses between each factor and behavior intention of buying meat and dairy alternatives as well as the hypotheses between each barrier and the gap of customers’ behavior and behavior intention to buy meat and dairy alternatives, in order to find the significant factor(s) and barrier(s) to include into the revised study model. Dummy variables were used, when age, gender, occupation, education and income were put into the regression analysis.

3.4 Reliability and Validity

We conducted the respondent validation to ensure our qualitative method’s reliability as instructed by Bryman and Bell (2011; p. 401). We summarized the focus group interviewers’ responses and comments and submitted them to get them examined for accuracy and validity and to confirm that we understood their responses correctly.

We conducted a pilot testing (see 3.3.3 for details) to ensure the reliability of our quantitative method. We learnt from the pilot study that the introduction paragraph should be added to give respondents a better understanding about our research goal and certain questions were
not easy to understand, hence we changed the survey structure and fine-tuned some of our questions.

Furthermore, the questionnaire construct was explored by factor analysis and reliability analysis (see 4.2.2 for details). Using SPSS statistics software, The Cronbach’s Alpha of the attitude scale was 0.801 and of the subjective norm scale was 0.799, which meant the items had a good internal consistency reliability.

Due to our limited sample size however, external validity, also called generalization cannot be guaranteed. This is the case, because there are some limitations in our sample population. Our respondents are not representative of Swedish society as a whole for different reasons. First of all, the online respondents were mostly students studying at the University of Uppsala, since these were people that we personally knew and that would be likely to try and help us. Secondly, because most of our friends are female, this gave us a sample with more females than males. A large amount of students means of course also that our age sample is not representative, as well as the education level of the general population, because we as Master students know a lot of Master and PhD students. Moreover, one of the authors is vegan and has some vegan friends, who may have shared the link with other vegans. This gave us a large percentage of vegans in our sample, larger than the actual percentage of vegans in the Swedish population. This means, that there cannot be a perfect generalization when it comes to Swedish society as a whole.

3.5. Limitations

Limitations for our study include the fact that we cannot generalize our results to Sweden as a whole. Moreover, we faced time and resource constraints. Also, the topic of meat and dairy replacements is still quite new, so there are probably many aspects that have not been researched yet and there are factors that we have ignored in our analysis, like the effect of media on people. How are vegetarians and vegans and the products that they eat represented, and how does it affect people? There is also a lot of research being done on cognitive dissonance, for our topic, that would be how can people say they love animals, but then eat them at the same time? There are many more factors, like what kind of message eating meat sends to other people, that we could have included, but we had to keep the results manageable, so we decided to focus on a few very specific factors.
3.6 Concluding research methods

To sum up, we made use of the explanatory sequential design, where an initial qualitative study informed and helped the development of our main quantitative study. The qualitative study was done in form of a focus group interview, while the quantitative part was a survey that we put online, as well as answers to face-to-face interviews. In the following chapter, we will go into more detail of the results of the focus group, before presenting our statistical analysis of the survey. The important thing to remember is that both studies offer different insights, but that the quantitative study was dependent on the qualitative part.
4. Results

4.1 Qualitative study

As previously stated, the goal of the qualitative study was mainly to ensure that we had all the factors that influence consumer behavior’s choice when it comes to buying or not buying plant-based products. Moreover we thought it was a good chance to actually test how the taste of the alternative products ranks against the conventional one in a consumer taste test. All five respondents were free to talk as much as they liked, we only moved on to the next question, when nobody had anything more to say. All respondents looked comfortable, there was no question that they did not want to answer and the interview took about 40 minutes.

4.1.1 Behavior

We started the focus group interview, after a short introduction of what plant-based products are, by asking the respondents about their current behavior. When it comes to the real animal products, all five interviewees consumed dairy products, be it milk in the coffee or cheese and yoghurt on a daily basis. One person consumes some form of meat or fish every day; one person has one vegetarian day a week. Two people have 2-3 vegetarian days and one person only eats fish or meat once a week. Interestingly, in the beginning, people said less, because they did not only include fish in their definition of vegetarian, some of them also did also not count chicken as meat. Most of the respondents buy plant-based milk and yoghurt replacements on a semi-regular basis, but only one person has ever tried analog meat before, in the form of Seitan. The products that our respondents have tried before include soymilk, cream and yoghurt, oat milk as well as almond milk. One person used to buy plant-based milk before, because of lactose intolerance, but nowadays prefers the lactose-free milk, because the taste is closer to the “normal thing”.

“A few years ago the only choice was those things like oat. That felt like a punishment. But now there are so many good lactose-free milks that actually taste like the normal thing. But actually I’ve chosen to have soymilk sometimes when I have smoothies. I’ll have soymilk and some other yoghurt to get some of the vitamins from the soymilk. The bad thing is just when I open those, they are only good for a couple of days.”
The interviewees use the milk products for cooking, for smoothies or in coffee, but very rarely drink them as plain milk. Moreover we found out, that in general, milk replacements seemed to be more popular than meat replacements. When asked about general knowledge on the subject, if they knew any brand names or products available at the conventional grocery store, they mostly answered with milk alternatives companies. The ones that they knew were the Swedish company Oatly, as well as ICA’s (the biggest grocery chain in Sweden) own brand of plant-based milks and Alpro Soya. They could not name any plant-based cheeses or meat replacements, even though there are plenty in supermarkets in Sweden. One person elaborated more generally on the subject, without naming brands:

“There is quite a large amount of vegetarians in Sweden and it’s socially accepted to be a vegetarian or vegan so the brands for vegetarian food have quite a good space in the stores”

4.1.2 Behavioral Intention

Towards the end of our interview, we asked our respondents whether they would consider switching more to the plant-based products if the most important criteria they mentioned (which are taste and the artisanal, traditional aspect of a product) were met by the replacement product. The result was, that they would all consider giving up more dairy products for the plant-based alternatives, but rather than eating meat replacements, they would consume more vegetables and other whole foods.

“I’m not that fond of meat that I need a replacement for it. If I need to diminish my meat consumption, then I’ll just go vegetarian more days a week.” “I try to avoid meat in total.” “Maybe in the milk and cheese choices, the meat, I’m not interested in. Then I can eat vegetarian instead.” “If it was for the health, then I would try to just avoid meat, not find a replacement, eat vegetables instead”

The information on the environmental damage of animal farming has not really made them change their habits, but they are aware that they might have to change in the future. They take other environmental initiatives though, like recycling and buying less in general. More than buying animal free products, they pay attention to buy mostly local and organic and clean food.
“Also I know that because of all the things, those problems, that have been written more and more about, I sort of am prepared that some time in the future, I have to make a choice, but I hope that will be as far away as possible, but I feel quite sure that I have to make a choice.”

4.1.3 Attitude

We went through all of the variables in a reformulated way, which we identified as influencing a person’s attitude towards a certain behavior. In our case, it is the behavior of buying a plant-based replacement of an animal product. In general, the respondents were moderately concerned about their health. When buying food, other things, like buying local, which will be discussed shortly, were more important than always buying the healthiest products. The taste was a bigger issue and one where most of our replacement products failed. When we talked about replacements in general, the interviewees almost all said, that oat milk was too sweet, but that it tastes different from one company to another. Almond milk was generally favored. Plant-based yoghurts taste good, as well as soymilk and cream. However they did not like the taste of the replacement cheese that we brought.

“Tastes like plastic cheese.” “It feels dry.”

The analog meat got mixed reviews as well. It was also the most obvious to detect as fake, even before trying. Although they thought it tasted ok, already the visual aspect made it obvious it was not real meat.

“What’s this supposed to be?” “It tastes like sausage kind of. I like the taste but it shouldn’t look like that if it tastes like that.” “I didn’t like the consistency.”

4.1.4 Subjective Norm

The issue of Subjective Norm was touched in context to the gatekeeper problem in the barriers section. We asked our interviewees what influence their family and friends have on their decisions and they all replied that they mostly discuss and take decisions together with their partner. One person, who had grandchildren, said that they influence what he buys. However in general, people are influenced only moderately by their partner and not at all by colleagues.
4.1.5 Barriers

The barriers that we had previously established only moderately influenced our focus group. Concerning price, they said the following:

“Of course it’s a factor, but I think in our middle-class urban style of living, it’s a marginal factor in a way, to some extent.” “But I would say then, if a cheese is the most exceptional beautiful thing in the world, I would buy it as a luxury product instead of an everyday cheese. I would change my manner of eating cheese.”

Another barrier that we talked about was information. All of the respondents were quite well informed, on the subject of environmental destruction by intensive animal farming, as well as what kind of products there are, and the fact that they can be found at the normal grocery store. When we asked where they got the environmental knowledge, they said from the media as well as through own research and books. University also gave some knowledge on the issue. On the environmental issue itself, they said the following:

“Animal farming causes methane gas emissions, it’s bad for greenhouse gas emissions” “You need much more area to produce meat. You need to produce food for the cow, and then you need area for the cow, you need much more area to produce the food you eat, than if you eat vegetables, so there’s less space for forests, there is less regeneration of oxygen.”

We also touched on the gatekeeper problem, but that question was quickly answered. The people that live with partners and/or children take their decisions jointly. One person answered that even grandchildren are considered when they decide on what to buy.

One more barrier, which we added only after the focus group interview, was the issue of the ties between food and tradition. Interestingly, the people disliked the real cheese that we brought just as much as the plant-based cheese. This is because of its synthetic taste. It was low quality, mass-produced and processed cheese. As it is important for our respondents to buy local and organic, they also pay attention to the artisanal value of a product, the tradition behind the recipes and the craft that goes into producing the food. They take this into account, for the animal product, as well as for the plant-based product. That means that they would not buy a mass-produced, processed plant-based cheese, even if it tasted good.
“I like cheese making a lot and the cheese makers. So I guess these are only industrial cheeses and that’s not interesting. That’s another issue also.” “Even the fake one if it was tasting good, if it’s an industrial thing, it’s less interesting also.” “I would never touch it.”

After these statements, we decided to add one additional barrier to our survey, the traditions tied to food.

4.2 Quantitative study

After getting the data from previous studies done on the subject and coupling it with our findings from the focus group interview, we set up the questionnaire. All questions were asked in a way that was compatible with a later analysis using SPSS.

4.2.1 Descriptive statistics

We got ninety responses in total and all of them were valid with the filling-in rate being 100%. We got confirmation from our statistical advisor of Uppsala University that it was sufficient for our study. A complete description of consumers’ characteristics is shown in Table 2 and we will focus on each item in the following paragraphs.

Gender

In the 90 valid questionnaires, there was an unbalanced percentage of the sample’s genders with 56 female respondents and 34 male respondents.

Age

43.3% of total respondents aged from 20 to 25 while 5.6% for 15-20, 23.3% for 25-30, 11.1% for 30-40, 11.1% for 40-60 and 5.6% for and up. We had questionnaires covering almost all age ranges with 48.9% under 25 and 51.1% over 25.

Income (SEK/Month)

62.2% of the respondents’ monthly income was lower than 25,000 SEK and 44.4% of the respondents’ monthly income was lower than 15,000 SEK. Only 4.4% respondents’ monthly income was higher than 55,000 SEK while 8.9% respondents preferred not to answer. These
low numbers are of course because many people are still students, and they did not factor in their parents’ income.

Education
6.7% of our respondents had Master degrees and 25.6% had Bachelor degrees and in total 65.6% of our respondents had education equal or higher than a Bachelor. While 10 respondents have completed secondary education with a diploma, 4 respondents only have secondary education without a diploma and 16 respondents have some form of higher education. They cover respectively 11.1%, 4.4% and 17.8%.

Occupation
67.8% of our respondents were students and 26.7% of our respondents were working while 4.4% were retired and only 1.1% unemployed.

Diet
54.4% of our respondents were omnivorous and 20% were flexitarian. 15.6% of our respondents were completely vegan, while 6.7% of our respondents were vegetarian and 3.3% pescitarian. It is to be noted, that the high number of vegans might come from the fact, that because one of the authors is vegan, she knows other vegans and because it is a supporting community, through the snowball effect, the survey was passed around. The high number of vegans is not representative for Swedish society as a whole.
Table 2: Respondents’ demographics details (n=90)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Items</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
<td>66</td>
<td>62.2</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>34</td>
<td>37.8</td>
</tr>
<tr>
<td>Age</td>
<td>10-15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>16-20</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>21-25</td>
<td>39</td>
<td>43.3</td>
</tr>
<tr>
<td></td>
<td>26-30</td>
<td>21</td>
<td>23.3</td>
</tr>
<tr>
<td></td>
<td>31-40</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>41-60</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>61 and up</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>Income (SEK/Month)</td>
<td>0-10,000 SEK</td>
<td>22</td>
<td>24.4</td>
</tr>
<tr>
<td></td>
<td>10,000-15,000 SEK</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>15,000-25,000 SEK</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td></td>
<td>25,000-35,000 SEK</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>35,000-55,000 SEK</td>
<td>11</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>55,000 SEK and up</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>I prefer not to answer</td>
<td>8</td>
<td>8.9</td>
</tr>
<tr>
<td>Education</td>
<td>Bachelor</td>
<td>23</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td>I prefer not to answer</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Masters</td>
<td>33</td>
<td>36.7</td>
</tr>
<tr>
<td></td>
<td>PhD</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Secondary school diploma</td>
<td>10</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>Secondary school without diploma</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>Some form of higher education</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td>Occupation</td>
<td>Retired</td>
<td>4</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>Student</td>
<td>61</td>
<td>67.8</td>
</tr>
<tr>
<td></td>
<td>Stay at home parent</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Working</td>
<td>24</td>
<td>26.7</td>
</tr>
<tr>
<td>Diet</td>
<td>Flexitarian</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Omnivorous</td>
<td>49</td>
<td>54.4</td>
</tr>
<tr>
<td></td>
<td>Pescitarian</td>
<td>3</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Vegan</td>
<td>14</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td>Vegetarian</td>
<td>6</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Figure 3 below shows what the different diet groups think about how severe the impact of intense animal farming is on the environment (see question 16 in Appendix 2). Vegetarians average at around 6.50 and vegans average at around 6.36, which means they know how disastrous animal farming is and what the consequences are in terms of climate change for example. Flexitarians put the impact at around 5.22 and pescitarians at 4.67. Omnivores underestimate the impact, giving it only an average score of 3.51. This confirms what previous research suggests, that vegans and vegetarians are often more environmentally conscious (Hoek et al., 2011; Hoek et al., 2004).

Figure 4 shows us the percentage of each diet group for the frequency with which they consume replacement products. Interestingly, a higher percentage of vegetarians than vegans consume replacements every day. This might also have to do with the fact that only very few respondents were vegetarian, so their answer carried more weight than that of the vegans. Very few vegans and vegetarians never consume replacements, while the percentage for the
other diet groups is quite high. The vegans and vegetarians that chose the answer never or very seldom are the people that prefer less processed foods and more whole foods. This assumption can be made, because they will not consume animal products either, so their third choice is whole foods, like nuts grains and vegetables. Only around 37% of vegans say they use replacements on a daily basis, and only around 50% of vegetarians. This is very interesting for replacement companies to know, because they should take some measures to grasp a bigger part of the vegan and vegetarian market that is not taken by meat and dairy producers.

![Figure 3 Knowledge about the harmful effect of animal farming on environment among different diet groups](image)

![Figure 4 Frequency of consuming replacements by different diet groups](image)
4.2.2 Factor Analysis and Reliability Analysis

Factor analysis verifies a big group of items and finds a way that data may be "reduced" or "summarized" in a smaller group of components. It discovers groups among the intercorrelations of a number of items (Pallant, 2010; p.181). We conducted a factor analysis among the attitude variables and the subjective norm variables. That way, we verified every item and checked if each variable of the items was correct.

We had 5 items in the attitude variable and 3 items in the subjective norm variable. To build construct validity, the items were subjected to a factor analysis by using principal components analysis with direct oblimin rotation. Prior to conducting the principal components analysis, we assessed the suitability of the data for factor analysis. The result showed that in the correlation matrix, all coefficients of the items were 0.3 and above. The Kaiser-Meyer-Olkin value was 0.731 for the attitude variable and 0.632 for the subjective norm variable, both above the recommended value of 0.6 (Kaiser 1970, 1974) and Bartlett’s Test of Sphericity (Bartlett, 1954) reached statistical significance which means the correlation matrix of each variable is factorable.

The results of the factor analysis are shown in Table 3 and Table 4. In the attitude component, only one eigenvalue was over the cut-off value 1 and explained 56.92% of the variance while in the subjective norm component also only one eigenvalue was over the cut-off value 1 and explained 71.41% of the variance. As presented in Table 3 and Table 4, all items loaded above 0.560, which means significant and discriminant validity as well as convergent validity were both very high (Hair et al., 2014).

Table 3 Rotated Component Matrix of Attitude*

<table>
<thead>
<tr>
<th>Component</th>
<th>Eigenvalue</th>
<th>Variance Explained</th>
<th>Item</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>2.946</td>
<td>56.92%</td>
<td>Health choice</td>
<td>0.890</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Good tart</td>
<td>0.927</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Animals care</td>
<td>0.743</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Environment friendly</td>
<td>0.636</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Good feeling</td>
<td>0.636</td>
</tr>
</tbody>
</table>

Table 4 Rotated Component Matrix of Subjective Norm*

<table>
<thead>
<tr>
<th>Component</th>
<th>Eigenvalue</th>
<th>Variance Explained</th>
<th>Item</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Norm</td>
<td>2.142</td>
<td>71.41%</td>
<td>Friends influence</td>
<td>0.912</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Family influence</td>
<td>0.816</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Colleague influence</td>
<td>0.802</td>
</tr>
</tbody>
</table>
Accordingly, all the items were verified and both attitude component and subjective norm component were checked to be correct. A final examination of reliability of the items for each component was also conducted by using reliability statistics. The Cronbach’s Alpha of the attitude component was 0.801 and of the subjective norm component was 0.799, which were all above 0.7, showing both components had good internal consistency reliability. Hence the constructs’ validity and reliability were confirmed and we were able to use the two components for analysis.

4.2.3 Data analysis of Equation 1

Equation 1\(^2\) tested H1, the hypothesis that a person’s behavioral intention to buy meat and dairy replacement products has a strong positive relationship to their actual behavior of buying those products (see chapter 2.3 for the theory). Based on the questionnaire (see Appendix 2) and following the structure of Equation 1, we had two variables including the independent variable Behavioral Intention (BI) of buying meat and dairy alternatives (See question 7) and dependent variable Behavior (B) (see question 5).

Firstly, we examined the assumptions of simple regression. No outliers were found on both variables. Behavior and Behavior Intention showed abnormal tendencies, but still in the scope of what could be handled by regression analysis, hence the regressions were robust (Pallant, 2011; p.158).

Secondly, we used the linear simple regression to test hypothesis 1. In the following simple regression analysis, independent variable Behavioral Intention explained 40.4% of the variance for Behavior (R\(^2\)=0.404, F(1,90)= 59.681, p=.000), hence the equation fitted the data well (see Table 5).

H1 tested if a person’s behavioral intention to buy meat and dairy replacement products has a strong positive relationship to their actual behavior of buying those products. The Standardized Coefficient Beta of BI was 0.636 (p<0.001). If BI increased 1-point, B would have 0.636 unit increased. It showed that behavioral intention to buy meat and dairy

\^2 The Equation 1: B = BI (ω1)
replacement products has a strong positive relationship to actual behavior of buying those products. H1 was supported.

Table 5 Results from the regression analysis

<table>
<thead>
<tr>
<th>Dependent Variable: Behaviour (B)</th>
<th>β</th>
<th>s.e.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioral Intention (BI)</td>
<td>0.636***</td>
<td>0.084</td>
</tr>
</tbody>
</table>

Diagnostics
- Observations: 90
- R-squared: 0.404
- Adj. R-squared: 0.397
- F-statistics: 59.681

* p<.05, ** p<.01, *** p<.001, Two-tailed tests.

4.2.4 Data analysis of Equation 2

We conducted our statistical testing of the Equation 2 in which we will test H2 to H4 (see chapter 2.3 for the theory and hypotheses). Testing was based on the questionnaire (see Appendix 2). Following the structure of Equation 2, we had two variables in the questionnaire to predict the behavioral intention (BI) to buy meat and dairy alternatives (see question 7) which are attitude (Aact) (see question 8) and subjective norm (SN) (see question 9), and dummy variables Gender, Age1 to Age6 and Occupation1 to Occupation4 (See question 11, 12, 13) which indirectly affect behavioral intention (Ajzen & Fishbein 1980).

Linear Multiple Regression

Firstly, the data needed to be transformed from respective items into two components, which we discovered in the factor analysis (see Table 3 and Table 4). As shown in the Table 3 and Table 4, all the items loaded on their own component and they were computed into their respective component successively. Attitude variable and subjective norm variable were both proven significant after the computing.

Secondly, nobody chose the “stay at home parent” occupation (see question 13), hence the dummy variable Occupation 2 was taken out of the analysis by SPSS automatically. Then we

3 The Equation 2: B ~ BI = Aact (ω1) + SN (ω2) + Gender (ω3) + Age1 (ω4) + Age2 (ω5) + Age3 (ω6) + Age4 (ω7) + Age5 (ω8) + Age6 (ω9) + Occupation1 (ω10) + Occupation2 (ω11) + Occupation3 (ω12) + Occupation4 (ω13)

4 Occupation2 = Dummy variable 2 of Occupation (Occupation2 = 1 if stay at home parent, 0 otherwise)
examined the assumptions of multiple regression. Since there were no respondents between the ages of 10 to 15, that option was excluded by SPSS as reference. Hence dummy variable Age2 was chosen as reference to avoid a dummy variable trap. The Pearson Correlation Matrix was used to check the multicollinearity of the data. The coefficients were low, ranging between -0.482 and 0.586, which showed no violation of the assumptions of perfect multicollinearity, and enabled a multiple regression analysis (Hair et al., 2014). We further checked the variance inflation factor (VIF) for all the variables and all of them were below 10, which confirmed no multicollinearity (Pallant 2011; p.158). Three outliers were found on the subjective norm variable but we decided to keep them, because due to the 7 point Likert scale, removing them could have given us misleading results (Hair et al., 2014). The Aact variable and SN variable showed abnormal tendencies, but still in the range which could be handled by the regression analysis, hence the regressions were robust (Pallant, 2011; p.158).

Thirdly, we use the linear multiple regression to test hypotheses 2 to 4. In the following multiple regression analysis, we included independent variables attitude and subjective norm and control dummy variables Gender, Age1 to Age6 and Occupation1 to Occupation4 which explained 38.8% of the variance for BI (R²=0.388, F(11,90)=4.498, p=.000), hence the equation fitted the data well (see Table 6).

H2 tested if consumers’ attitude towards certain meat and dairy alternatives has a positive relationship with their intention to buy those products. The Standardized Coefficient Beta of Aact was 0.287 (p<0.01). If Aact increased 1-point, BI would have 0.287 unit increased. It showed that attitude towards certain meat and dairy alternatives had a positive and significant impact on intention to those products. H2 was supported.

H3 tested if subjective norm had a positive relationship towards the behavior intention to buy meat and dairy alternatives. The Standardized Coefficient Beta of SN was 0.220 (p<0.05). If SN increased 1-point, BI would have 0.220 unit increased. It showed that subjective norm had a positive and significant impact on the behavior intention to buy meat and dairy alternatives. H3 was supported.

5 Age2 = Dummy variable 2 of Age (Age2 = 1 if 21-25 years old, 0 otherwise)
H4 tested if a person’s socio-demographic background (age, gender, occupation) indirectly influences their intention to buy meat and dairy replacement products. The Standardized Coefficient Beta of Gender was 0.307 (p<0.01) which means the behavior intention of females was significantly higher than males, by 0.307 unit. There was no statistical significance in regression for Age and Occupation due to Standardized Coefficient Beta <0.18 and p=n.s. H4 was supported with gender indirectly influencing their intention to buy meat and dairy replacement products.

**Table 6** Results from the regression analysis

<table>
<thead>
<tr>
<th>Dependent Variable: Behavioural Intention (BI)</th>
<th>β</th>
<th>s. e.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude (A-act)</td>
<td>.287</td>
<td>.023</td>
</tr>
<tr>
<td>Subjective Norm (SN)</td>
<td>.220</td>
<td>.053</td>
</tr>
<tr>
<td>Gender</td>
<td>.307</td>
<td>.428</td>
</tr>
<tr>
<td>Age1</td>
<td>.054</td>
<td>3.066</td>
</tr>
<tr>
<td>Age2</td>
<td>-0.025</td>
<td>0.921</td>
</tr>
<tr>
<td>Age3</td>
<td>0.131</td>
<td>0.763</td>
</tr>
<tr>
<td>Age4</td>
<td>0.144</td>
<td>0.51</td>
</tr>
<tr>
<td>Age5</td>
<td>0.176</td>
<td>0.889</td>
</tr>
<tr>
<td>Occupation4</td>
<td>-0.158</td>
<td>3.277</td>
</tr>
<tr>
<td>Occupation3</td>
<td>-0.125</td>
<td>1.92</td>
</tr>
<tr>
<td>Occupation1</td>
<td>-0.149</td>
<td>0.645</td>
</tr>
</tbody>
</table>

**Diagnostics**

- Observations: 90
- R-squared: 0.388
- Adj. R-squared: 0.302
- F-statistics: 4.498

* p<0.05, **p<0.01, ***p<0.001. Two-tailed tests.

### 4.2.5 Data analysis of Equation 3

We tested H5, that besides age, gender and occupation, a person’s socio-demographic factors of income and education indirectly influence their intention to buy meat and dairy replacement products (see chapter 2.4 for the theory) in our Equation 3. Equation 3 is based on:

\[ B \sim BI = A_{act} (\omega_1) + SN (\omega_2) + Gender (\omega_3) + Age1 (\omega_4) + Age2 (\omega_5) + Age3 (\omega_6) + Age4 (\omega_7) + Age5 (\omega_8) + Age6 (\omega_9) + Occupation1 (\omega_{10}) + Occupation2 (\omega_{11}) + Occupation3 (\omega_{12}) + Occupation4 (\omega_{13}) + Income1 (\omega_{14}) + Income2 (\omega_{15}) + Income3 (\omega_{16}) + Income4 (\omega_{17}) + Income5 (\omega_{18}) + Income6 (\omega_{19}) + Education1 (\omega_{20}) + Education2 (\omega_{21}) + Education3 (\omega_{22}) + Education4 (\omega_{23}) + Education5 (\omega_{24}) + Education6 (\omega_{25}) \]
on Equation 2 with two more added dummy variables, Income1 to Income6 (See question 17 of the questionnaire in Appendix 2) and Education1 to Education6 (See question 15 of the questionnaire in Appendix 2). Factor analysis and data transformation among the attitude variable and the subjective norm variable won’t be reported again here (See chapter 4.2.2 and 4.2.4 for details).

**Linear Multiple Regression**

First, the dummy variable Occupation2 and dummy variable Age2 were taken out from the analysis for the same reason as mentioned before (see 4.2.4). Then we checked the assumptions of multiple regression. Outliers and normality examination for continuous variables (Aact variable and SN variable) won’t be reported here again (see chapter 4.2.4 for details). The data was examined through the Pearson Correlation Matrix. The coefficients were low, ranging between -0.482 and 0.586 which shows no perfect multicollinearity existed and it was suitable for multiple regression analysis (Hair et al. 2014). Further, we checked the variance inflation factors (VIF), which were all below 10, confirming that multicollinearity was not an issue; therefore the regressions were robust (Pallant, 2011; p.158).

Second, we tested hypotheses 5 with linear multiple regression. This model included the independent variables SN and Aact and control dummy variables Income1 to Income6, Education1 to Education6, Age1 to Age6, Occupation1 to Occupation4 and Gender. It explained 45.8% of the variance for BI (R²=0.458, F (23,90)=2.427, p=.000), hence the equation fitted the data well (see Table 7). In Table 7 we only showed part of our variables including Income, Education, Gender, Attitude and Subjective Norm. The rest we had already discussed in the previous section (see Table 6) and they were not significant in this model so we didn’t show them in our table.

H5 tested that besides age, gender and occupation, a person’s socio-demographic factors of income and education indirectly influence their intention to buy meat and dairy replacement products. Most of the Income dummy variables showed no statistical significance in regression except for dummy variable Income4 (income ranges from 35,000 to 55,000 SEK/month). Its Standardized Coefficient Beta value was 0.294(p<0.05). There was also no statistical significance in regression for Age, Occupation and Education due to the absolute beta coefficients <0.284 and p=n.s. Hence H5 was not supported.
Table 7 Results from the regression analysis

<table>
<thead>
<tr>
<th>Dependent Variable: Behavioural Intention (BI)</th>
<th>B</th>
<th>s.e.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude (A-act)</td>
<td>0.245*</td>
<td>0.025</td>
</tr>
<tr>
<td>Subjective Norm (SN)</td>
<td>0.332**</td>
<td>0.064</td>
</tr>
<tr>
<td>Gender</td>
<td>0.276*</td>
<td>0.492</td>
</tr>
<tr>
<td>Income6</td>
<td>0.001</td>
<td>0.825</td>
</tr>
<tr>
<td>Income5</td>
<td>0.115</td>
<td>1.28</td>
</tr>
<tr>
<td>Income6</td>
<td>0.294*</td>
<td>0.915</td>
</tr>
<tr>
<td>Income3</td>
<td>0.117</td>
<td>0.339</td>
</tr>
<tr>
<td>Income2</td>
<td>0.058</td>
<td>0.705</td>
</tr>
<tr>
<td>Income1</td>
<td>0.207</td>
<td>0.644</td>
</tr>
<tr>
<td>Education6</td>
<td>0.095</td>
<td>2.464</td>
</tr>
<tr>
<td>Education5</td>
<td>-0.124</td>
<td>1.692</td>
</tr>
<tr>
<td>Education4</td>
<td>-0.075</td>
<td>1.255</td>
</tr>
<tr>
<td>Education3</td>
<td>-0.071</td>
<td>1.23</td>
</tr>
<tr>
<td>Education2</td>
<td>-0.089</td>
<td>1.275</td>
</tr>
<tr>
<td>Education1</td>
<td>0.041</td>
<td>1.334</td>
</tr>
</tbody>
</table>

**Diagnostics**

<table>
<thead>
<tr>
<th>Observations</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.458</td>
</tr>
<tr>
<td>Adj. R-squared</td>
<td>0.289</td>
</tr>
<tr>
<td>F-statistics</td>
<td>2.427</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001. Two-tailed tests.

4.2.6 Data analysis of Equation 4

We conducted our statistical testing of Equation 4\(^7\) to test H6a to H6f (see chapter 2.4 for the theory and hypotheses). Following the structure of Equation 4, we had 6 barriers (see question 10) to predict the gap (BI-B) between behavior (see question 5) and behavior intention (see question 7) to buy meat and dairy alternatives. The variables include the cultural barrier (CB), the gatekeeper barrier (GB), the information barrier (IB), the availability barrier (AB), the price barrier (PB) and the food neophobia barrier (FNB) with controlled dummy variables of gender (see question 11), Age1 to Age6 (see question 12), Occupation1 to Occupation4 (see question 13), Income1 to Income6 (see question 17) and Education1 to Education6 (see question 29).

---

question 15), which are supposed to have an indirect effect on behavior and behavior intention gap to buy meat and dairy alternatives. Since all the 6 barriers were very different from each other, there was no need to test internal consistency.

**Linear Multiple Regression**

First, for the same reason as before, dummy variables Occupation2 and Age2 were deleted from the analysis by SPSS (see 4.2.4). Then we examined the assumptions of multiple regression. The Pearson Correlation Coefficients among these variables were low, ranging between -0.446 and 0.586 which showed no perfect multicollinearity and was suitable for multiple regression analysis (Hair et al. 2014). Further we checked the variance inflation factor (VIF), which was below 10 for all variables, hence indicating that multicollinearity was not a problem (Pallant, 2011; p.158). 2 outliers were found in the availability barrier and 3 outliers were found in the gatekeeper barrier, but we decided to keep them, because according to Hair (2014), removing them could have given us misleading results, due to the fact that we have the 7-point Likert scale. However, the food neophobia barrier had too many outliers (more than 20 outliers among 90 respondents), which could influence the result of the regression analysis (Pallant, 2011; p.151) so we had to eliminate it from the analysis. Hence H6f could not be tested in our regression and our Equation 4\(^8\) will be used to test the rest of the hypotheses (H6a to H6e). The barrier variables showed abnormal tendencies, but still within the range, which could be handled by the regression analysis, hence the regression was robust (Pallant, 2011; p.158).

Second, we tested hypotheses 6a to 6e by linear multiple regression. In this model we included the independent variables cultural barrier, gatekeeper barrier, information barrier, availability barrier, price barrier and control dummy variables gender, Age1 to Age6, Occupation1 to Occupation4, Income1 to Income6 and Education1 to Education6. It explained 42.8% of the variance for behavior and the behavioral intention gap (R\(^2\)=0.428, F (26,90)=1.814, p=0.028), hence the equation fitted the data well (see Table 8).

---

H6a tested if the cultural barrier has a positive influence on the behavioral intention gap. The Standardized Coefficient Beta of the culture barrier was 0.235 ($p<0.05$). If the culture barrier increased 1-point, the gap would have 0.235 unit increase. This shows that the culture barrier had a positive impact on the gap between behavioral intention and actual behavior of buying meat and dairy replacements. H6a was supported.

H6b tested if the gatekeeper barrier has a positive influence on the behavioral intention gap. The Standardized Coefficient Beta of the gatekeeper barrier was -0.214 ($p<0.05$). If the gatekeeper barrier increased 1-point, the gap would have 0.214 unit decrease. This was opposite to our hypothesis, since the statistic result showed the gatekeeper barrier had a negative impact on the gap between behavioral intention and actual behavior of buying meat and dairy replacements. H6b was not supported.

H6c tested if the information barrier has a positive influence on the behavioral intention gap. The Standardized Coefficient Beta of the information barrier was 0.269 ($p<0.05$). If the information barrier increased 1-point, the gap would have 0.269 unit increase. This shows that the information barrier had a positive impact on the gap between behavioral intention and actual behavior of buying meat and dairy replacements. H6c was supported.

H6d tested if the availability barrier has a positive influence on the behavioral intention gap. H6e tested if the price barrier has a positive influence on the behavioral intention gap. The Standardized Coefficient Beta of the availability barrier and the price barrier were both $<0.256$ and $p=n.s.$ This shows no statistical significance in the regression for the availability barrier and the price barrier. H6d and H6e were not supported.

H7 tested if a person’s socio-demographic background (age, gender, occupation, income, education) indirectly influences the behavioral intention gap. Most of the Occupation and Income dummy variables showed no statistical significance in the regression except for the Standardized Coefficient Beta value of dummy variable Income4 (income ranges from 35.000 to 55.000 SEK/month) and Income1 (income ranges from 10.00 and 15.000 SEK/month), which was 0.412 ($p<0.01$) and 0.338 ($p<0.05$) respectively. Furthermore, dummy variable Occupation1 (working)’s beta value was -0.365 ($p<0.05$). There was also no statistical significance in the regression for gender, age and education due to the absolute beta coefficients $<0.256$ and $p=n.s.$ Hence H7 was not supported.
Table 8 Results from the regression analysis

<table>
<thead>
<tr>
<th>Dependent Variable: Behavioural Intention (BI)</th>
<th>β</th>
<th>s.c.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culture Barrier (CB)</td>
<td>.235*</td>
<td>0.018</td>
</tr>
<tr>
<td>Decision Barrier (DB)</td>
<td>-.214*</td>
<td>0.033</td>
</tr>
<tr>
<td>Information Barrier (IB)</td>
<td>.269*</td>
<td>0.025</td>
</tr>
<tr>
<td>Availability Barrier (AB)</td>
<td>-.184</td>
<td>0.014</td>
</tr>
<tr>
<td>Price Barrier (PB)</td>
<td>.085</td>
<td>0.015</td>
</tr>
<tr>
<td>Occupation4</td>
<td>.256</td>
<td>1.27</td>
</tr>
<tr>
<td>Occupation3</td>
<td>-.092</td>
<td>1.683</td>
</tr>
<tr>
<td>Occupation1</td>
<td>-.365*</td>
<td>0.436</td>
</tr>
<tr>
<td>Gender</td>
<td>-.036</td>
<td>0.251</td>
</tr>
<tr>
<td>Age4</td>
<td>-.19</td>
<td>1.246</td>
</tr>
<tr>
<td>Age5</td>
<td>.235</td>
<td>0.561</td>
</tr>
<tr>
<td>Age6</td>
<td>-.055</td>
<td>0.440</td>
</tr>
<tr>
<td>Age3</td>
<td>-.133</td>
<td>0.303</td>
</tr>
<tr>
<td>Age1</td>
<td>.133</td>
<td>0.547</td>
</tr>
<tr>
<td>Income4</td>
<td>.63</td>
<td>0.437</td>
</tr>
<tr>
<td>Income5</td>
<td>.13</td>
<td>0.666</td>
</tr>
<tr>
<td>Income4</td>
<td>.442**</td>
<td>0.473</td>
</tr>
<tr>
<td>Income3</td>
<td>.215</td>
<td>0.444</td>
</tr>
<tr>
<td>Income2</td>
<td>.096</td>
<td>0.359</td>
</tr>
<tr>
<td>Income1</td>
<td>.338*</td>
<td>0.345</td>
</tr>
<tr>
<td>Education6</td>
<td>-.109</td>
<td>1.202</td>
</tr>
<tr>
<td>Education5</td>
<td>-.121</td>
<td>0.896</td>
</tr>
<tr>
<td>Education4</td>
<td>.023</td>
<td>0.639</td>
</tr>
<tr>
<td>Education3</td>
<td>-.103</td>
<td>0.647</td>
</tr>
<tr>
<td>Education2</td>
<td>-.14</td>
<td>0.674</td>
</tr>
<tr>
<td>Education1</td>
<td>-.169</td>
<td>0.702</td>
</tr>
</tbody>
</table>

4.2.7 Concluding the quantitative study

In the descriptive statistics, the results showed that all classifications were covered by respondents. Although not all the data distributions were balanced, we still regarded the 90 respondents as valid data for Swedish consumers. All the three regression equations reached statistical significance and Table 9 shows the summary of our hypotheses results. On the basis of our qualitative and quantitative analysis, in the following chapter, we will further discuss our results.

Table 9 Summary of hypotheses results
<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: BI positively affects B</td>
<td>Supported</td>
</tr>
<tr>
<td>H2: Amct positively affects BI</td>
<td>Supported</td>
</tr>
<tr>
<td>H3: SN positively affects BI</td>
<td>Supported</td>
</tr>
<tr>
<td>H4: Age, Gender, Occupation indirectly affect BI</td>
<td>Supported</td>
</tr>
<tr>
<td>H5: Income and Education indirectly affect BI</td>
<td>not supported</td>
</tr>
<tr>
<td>H6a: Cultural Barrier positively affects Gap(BI-B)</td>
<td>Supported</td>
</tr>
<tr>
<td>H6b: Gatekeeper Barrier positively affects Gap(BI-B)</td>
<td>not supported</td>
</tr>
<tr>
<td>H6c: Information Barrier positively affects Gap(BI-B)</td>
<td>Supported</td>
</tr>
<tr>
<td>H6d: Availability Barrier positively affects Gap(BI-B)</td>
<td>not supported</td>
</tr>
<tr>
<td>H6e: Price Barrier positively affects Gap(BI-B)</td>
<td>not supported</td>
</tr>
<tr>
<td>H6f: Food Neophobia Barrier positively affects Gap(BI-B)</td>
<td>not tested</td>
</tr>
<tr>
<td>H7: Socio-demographic background indirectly affects Gap(BI-B)</td>
<td>not supported</td>
</tr>
</tbody>
</table>
5. Discussion

5.1 Behavioral Intention and Behavior

If we go back to the hypothesis number 1, that we came up with in the theory part, we can now confirm that H1 was correct. Through Equation 1 we tested the relationship between behavioral intention and behavior and found out that intention strongly influences behavior. They are however not identical. This confirms our theory, as well as the results of Myresten and Setterhall (2015), Vermeir and Verbeke (2006) and Kollmuss and Agyeman (2002).

5.2 Attitude

When we tested our Equation 2, H2 was confirmed as well. Attitude had a positive relation on behavioral intention. This means that if a consumer perceives meat and dairy replacements well and has a positive attitude towards them, his chances of buying them increase. The fact that attitude influences intention is not surprising, as similar studies using TRA have come out with the same result (Myresten & Setterhall, 2015). The hypothesis was confirmed one more time, with our own model, inspired by Li and Xin (2015). In Equation 3, attitude still had a positive influence on behavioral intention. The variables that are contained within the attitude factor, like health, taste, environmental consciousness, animal welfare concerns and a positive feeling have previously been proven to influence consumers. Our results are in accordance with Hoek et al. (2011) and Wansink et al. (2005), who also found that taste is an important factor for consumers. Moreover, Hoek et al. (2004) and Hoek et al. (2011) found that consumers of alternative products are much more health and environmentally conscious as well as care about animal welfare.

5.3 Subjective Norm

Hypothesis 3 was confirmed with Equation 2 as well, since our statistical analysis found that subjective norm indeed has a positive influence on behavioral intention. In this instance, our results differ from previous studies, as Myresten and Setterhall (2015) for example did not find subjective norm to be a significant influence on behavioral intention to buy organic food.

5.4 Barriers

Equation 4 finally tested the barriers, which keep people from buying the replacement products, once they already had the intention of doing so. After statistical testing, out of the
six barriers that we introduced, only two came out as having an influence on the gap between behavior intention and behavior. The two significant barriers are the culture barrier and the information barrier. It was surprising to us that the information barrier came out as influential, while price and availability were not. The fact, that culture is important to consumers is in line with what we found out during the focus group interview. People do not like overly processed and synthetic food, they like the traditional value of how food is produced, especially if it is made by hand and locally. This is a barrier towards meat and dairy replacements, because first of all, these products are quite new, so not a lot of traditions are attached to them. Moreover, a lot of these meat and cheese imitations are processed as well, to get the taste of the animal product. This discourages Swedish people from buying them.

The information barrier describes the problem, that information on theses products is not readily available, and will thus decrease the likelihood of people buying them. The analog products are still quite new on the market (Wansink et al., 2005) and they are considered niche markets. Over recent years they have started appearing in normal supermarkets, but a lot of consumers don’t know what they are made of, if and why they are healthier than the animal product and in which ways they are better for the environment. Not having all of that information readily and easily available makes it less likely that people will buy the products. This was confirmed by our focus group interview. While all of the respondents had already tried dairy alternatives, four of them had never tried replacement meats. They did not know what they were made of or if they were healthy or not. Kollmuss and Agyeman (2002) found that the lack of information was a barrier as well.

For the gatekeeper barrier we got an unusual result. Our analysis showed, that the barrier negatively influenced the gap, meaning if people cannot decide themselves what they buy, the gap would get smaller, which is counter logical. We can only try to explain this result with the fact, that maybe people have misunderstood this question and inversed their numbers. What surprised us was that food neophobia, which was such a big factor in Hoek et al.’s work (2011), had too many outliers for us, and so we could not do the analysis. We think that part of the reason might be that if you ask people directly if they like to try new foods, they might want to sound more advantageous and say yes, even though it is not true. This resulted in the fact that the majority of people said they completely disagree with the statement “I don’t like to try new foods”. The few people who chose a different answer thus became outliers and we could not include the variable in our analysis. Moreover, the price did not make an influence
on the behavioral intention gap. This might be, because Sweden has quite a comfortable middle-class and people do not really have to think about money first. However it is surprising, since most of our respondents are students, who usually look for bargains. From our focus group although it was obvious that price only had a second rank after more important factors like tradition, which plays a role in our model, and taste, which is part of the attitude factor. Availability was not significant in our analysis as well. We took this as a barrier from Kollmuss and Agyeman (2002), but Swedish consumers’ did not see it as a major influence. This might be, because these replacement products are readily available in conventional supermarkets in Sweden.

5.5. Background

In Equation 2 and 3 we tested which socio-demographic factors have an indirect effect on people’s behavior intention. In Equation 4 we tested which factors have an indirect effect on the behavioral intention gap. In both cases, the only factor that came out as significant in our analysis was gender. This was surprising, as we expected income to be a factor as well as education and maybe age. Other studies, like Greene-Finestone et al. (2008) have also found that more females than males were vegetarian. Hoek et al. (2004) supports this as well. On the other hand, previous studies found that education does effect the consumption of plant-based analogs. Hoek et al. (2011) found that in the Netherlands as well as in the UK, non-consumers of replacement products had a lower education level than medium or heavy consumers. This is understandable to some degree, because people need to be educated on the potential health, environment and animal welfare benefits of a meat and dairy reduced diet before they can make the conscious decision to give up those products for alternatives. This can also be connected to Pohjolainen et al.’s (2016) result, that people very often do not make the connection between climate change and meat production. The majority of respondents in Pohjolainen et al.’s study (2016) were neutral, so did neither agree nor disagree with the statement that animal farming was a threat to the environment. In our study we observed also, that the majority underestimated the effects animal production has on the environment. Especially omnivores scored the environmental consequences of intensive farming quite low. This shows that more sensitization has to be done to make people aware of the effects of factory farming. That is why we were surprised that education did not come out as a significant factor.
6. Conclusion

6.1 General Observations

The purpose of our research was to find out, what the main factors are that influence Swedish consumers’ decision on whether or not they will buy plant-based meat and dairy replacement products. As a conclusion, we can say that our results were partly surprising, and partly what we expected. As we expected from our theory (Vermeir & Verbeke, 2006; Elofsson et al., 2014) we did find that there is a gap between behavior intention and behavior, but that they were still closely linked. The only consistent socio-demographic factor that was found influential was gender. As expected, attitude influences consumers’ intention to buy a certain product. Swedish consumers are also influenced by their peers. The barriers towards actually buying the meat and dairy replacement products are information and culture. So in an answer to our research question, the drivers towards buying meat and dairy replacements are health, a concern for animal welfare, a concern for the environment, a good taste and getting a good feeling from buying the product. Moreover, a positive attitude from one’s entourage towards these products is important. The barriers that keep people from buying the product are a lack of information, as well as the fact that they are not engrained in Swedish culture yet. In general the Swedish people are somewhat aware of the environmental problems of animal farming, vegans more than omnivores. They have very diverse reasons for buying the animal products. Some people care more about buying local, supporting the Swedish producers and reducing transport costs, rather than buying an analog product. Moreover they appreciate the traditional aspect of their food, they like buying from farmers markets or more natural products with less preservatives and synthetic additives. They value the art behind preparing foods.

6.2 Academic and Managerial Implications

Our study contributes to the academia first of all by researching a quite recent topic. Plant-based replacement products for meat and dairy are still quite fresh on the market, but we will need them more in the future due to the negative environmental effects of conventional farming. Thus research on the acceptance of those products is needed. We also add valuable information due to our focus on Sweden and Swedish consumer behavior. Moreover, we confirm what previous studies have indicated, that the basic TRA model as it was conceptualized by Fishbein and Ajzen (1975) is incomplete, and that there is a gap between
behavioral intention and actual behavior. Lastly, our study adds to the academia our final model that we came up with as a way to test how barriers influence the behavioral intention gap.

For practitioners some of our findings offer new insights. The first factor which was influential to a consumer's behavior intention was attitude. Attitude consists of a concern for one's health, the environment, animal welfare, taste and an overall positive feeling. This means that companies have to focus even more on those positive attributes of their products. Very often meat replacements are described as bland and criticized for the fact that they are called vegetarian or vegan chicken or beef, but do not taste like it. Some companies are spending a big part of their research on getting the plant-based product to have the same look, consistency and taste than the original animal product (Kristof, 2015; Solon, 2016). That is also what we are advising companies to do, as multiple studies, like Hoek et al. (2011) and Wansink et al. (2005) found this to be important as well. Moreover, companies should use eco-friendly packaging for their product as this aligns with the fact that the product itself is more environmentally friendly than the animal alternative (Baumann, 2013; Weber, 2008). On the packaging and also in advertisements they should put more emphasis on the fact that they are eco-friendly. Getting some official certifications would also help in that case. As our research shows, environmental friendliness is a reason of why these products are chosen. Another important point would be to point towards the fact that no animals were harmed. Animal welfare is also one of the attitude factors that influences people. Companies could for example give a small percentage of their profits to animal sanctuaries or something similar to highlight the fact more that they are an ethical company that does not want to harm animals. Getting the certified vegan or vegetarian logo is also preferable, to make it easier to detect if the product is plant-based or not. Finally, the companies can make more of an effort to show how healthy their products are. Numerous studies show that users of plant-based products buy them for health reasons (Hoek et al. 2011; Hoek et al. 2004; Freeland-Graves et al., 1982; Springmann et al., 2016). Companies in the plant-based sector should factor this in, and first of all, design their products accordingly, which means getting rid of too many unnecessary chemicals and preservatives, as well as excessive amounts of sodium and fat, and also market them in the right way and point out the health benefits compared to animal products. By making their products healthier and less processed, companies can even take more advantage of the group of people that at the moment buys neither replacement products, nor the real animal product for health and ethical reasons. If consumers know all of this about their
product, the positive feeling when buying them comes automatically, because they know they have taken a choice that profits their health, the environment and animals.

As subjective norm is also an influence on people, word of mouth is important for plant-based companies. Consumers of these products are influenced by other people buying them, so positive feedbacks from friends and family are important.

Of the background factors none except for gender were influencing a person’s decision, but we would not necessarily advise companies to focus only on girls/women, because that might put them at risk of loosing their male customer base. A lot of foods have gender neutral packaging, and we would advise companies to do the same.

Furthermore, we found that two barriers were keeping people from buying plant-based replacements, even though they had the intention to do so. Those barriers are the cultural, traditional barrier and the information barrier. In order to overcome the cultural barrier, companies in Sweden could try to recreate Swedish traditional foods, with plant-based products. Vegan meatballs are already available at supermarkets and companies can do the same with other Swedish dishes. The packaging and marketing should put emphasis on the fact that the difference in taste is not noticeable between the plant-based and the animal product. It is also important that the foods are not overly processed but that the ingredients are kept simple and that the values of the company are represented in their products. The art of cooking is important. Concerning information, it is important for all of these companies to have good homepages in multiple languages, to make information easily accessible. They should also be on different social media platforms, especially facebook and twitter. Although our study has not shown this, other studies have shown that the vegan and vegetarian population is mostly young and middle aged (Hoek et al. 2011). Younger generations spend a lot of time on social media, and many companies now invest a lot of times into managing their presence on those platforms. Additionally, the government could help providing information by launching campaigns to make people aware of the environmental impact of intensive farming. After the climate summit in Paris, countries have signed treaties to take action against global warming, or at least reduce global warming in the years to come (UNFCCC, 2015), so these campaigns are important to get more people to make the connection between animal production and climate change.
Moreover, companies could think about bonding together to have a stronger influence on grocery stores and get their articles placed in more desirable spots. At the moment the replacement products cover only a small portion of a supermarket and are very often placed high or low on the shelf, where they are not easily visible. If companies can get together to get their products on eye height, it might help as well.

6.3 Limitations

As previously mentioned, there are some limitations to the generalization of this study. First, the problem with too little respondents is that a few outliers can immediately have an effect on the normality analysis. Furthermore, the issue is that the population is not representative of Swedish society, so even though the study is valid, it cannot be generalized. Plus, one of the authors is vegan herself and has vegan friends. The vegan society is always very supportive of each other, because they want to get the word out about animal suffering and the environment. This has probably resulted in a very strong snowball effect among the vegan community, explaining the very large amount of vegans in our sample. However, as we used convenience sampling, our study is valid, even with the non-representative population.

6.4 Suggestion for Future Research

This study test 6 barriers in barrier model and only two of them are significant (culture barrier and information barrier) For future research, these two barriers can be rechecked and more barriers need to be found in order to make this model more comprehensive. This study only collected data in Sweden. Since meat and dairy replacements are gradually becoming more popular among the world especially in Europe (Marketsandmarkets, 2015a; Marketsandmarkets, 2015b), future research can test the TRA model and barrier model in other countries and compare the results to find more common and different barriers and factors towards meat and dairy replacement consumption. Moreover, other aspects of plant-based products can be researched. Like we briefly announced in the method section, there are many more factors potentially influencing people when it comes to food. Research can be done in how the media talks about plant-based foods and how it influences people. How does the status of meat consumption and prejudices about vegans and vegetarians influence people’s attitudes toward the replacement products? All of these are potential areas for future research.
References


Appendixes

Appendix 1: Focus Group Preparation Sheet

The goal of our Focus Group:

What are the attitudes of consumers towards plant-based meat and dairy alternatives?
(Knowledge about products, knowledge about it related to environment)

Preparation:
1. Buy some fake and real cheese, fake and real milk, fake meat (for the taste)
2. Put milk in the coffee, to disguise the taste
3. Voice recording of everything
4. Short introduction about plant-based meat and dairy alternatives

Process:
1. Taste
   - Do you like the taste?
   - Could you say with confidence, which one is the real and which one is the analog product?

2. Knowledge about plant-based meat and dairy alternatives
   - Do you know any plant-based meat and dairy alternatives? Can you give some brand names?
   - Have you ever tried any before? (show the pictures of different products and brands.)

3. Will you buy plant-based meat and dairy alternatives
   - Will you ever buy it in the future? Why or why not?
   - Did you notice plant-based meat and dairy alternatives in the grocery store?
   - Do you pay attention to labels (fairtrade, sustainability, organic, local) or nutritional information?
   - Is price an issue when you take your grocery decisions?
   - Who is takes the decisions when it comes to grocery shopping?
4. Knowledge about meat consumption related to environmental problems
   - Have you ever given the topic any thought?
   - Do you have any knowledge about the health implications of animal products?
   - Do you have any knowledge about the environmental effects of excessive animal farming?
     (If there is somebody who doesn’t know about it, we should have a short introduction about it.)
   - After knowing the environmental problems related to meat consumption will you buy plant-based meat and dairy alternatives? Why or why not?
Appendix 2: Questionnaire

Behavior towards meat & dairy alternatives of Swedish consumers

In the following survey, we are analyzing the drivers and barriers towards meat & dairy replacements among Swedish consumers. Meat & dairy replacements are defined as plant-based alternatives towards the traditional animal derived product. In this category we can find milk made out of almonds, soy, rice coconut, oats etc. From that cheese and yoghurt can be made as well. Meat replacements are usually made out of soy, seitan or tempeh. These replacement products differ from other plant-based products like falafel etc. because they are specifically trying to imitate the taste and texture of the real animal derived product.

By filling out this questionnaire you agree to take part in our study. Your answers will be anonymous.

The survey should take you between 5-8 minutes.
You can leave your contact details in the end, if you consent to us contacting you in case we need some follow-up questions or if you want to receive the results of our study.

Thank you very much for your participation.

Q1. Are you currently living in Sweden?
   o Yes
   o No

Q2. Describe your diet.
   o Omnivorous
   o Flexitarian
   o Pescitarian
   o Vegetarian
   o Vegan
Q3. How much money do you spend on food in a week?
   - 0-200 SEK
   - 200-500 SEK
   - 500-750 SEK
   - 750-1,000 SEK
   - 1,000-1,500 SEK
   - 1,500 SEK and up

Q4. Have you ever tried plant-based meat & dairy replacements?
   - Yes
   - No

Q5. How often do you consume meat & dairy replacements in an AVERAGE MONTH?
   
<table>
<thead>
<tr>
<th>1, Never</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7, every day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q6. How often do you consume traditional meat & dairy products in an AVERAGE MONTH?

   
<table>
<thead>
<tr>
<th>1, Never</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7, every day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Q7. How often do you PLAN on consuming meat & dairy replacement products IN THE FUTURE?

   
<table>
<thead>
<tr>
<th>1, Never</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7, every day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q8. Please rate these statements on a scale from 1 (strongly disagree) to 7 (strongly agree).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think consuming meat &amp; dairy replacements is good for my health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The fact that meat &amp; dairy replacements are good for my health is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think meat &amp; dairy replacements are tasty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The fact that meat &amp; dairy replacements are tasty is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think consuming meat &amp; dairy replacements is better for animals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The fact that meat &amp; dairy replacements is better for animals is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think consuming meat &amp; dairy replacements is environmentally friendly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The fact that meat &amp; dairy replacements are environmentally friendly is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consuming meat &amp; dairy replacements makes me feel good</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The fact that consuming meat &amp; dairy replacements makes me feel good is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q9. Please rate these statements on a scale from 1 (strongly disagree) to 7 (strongly agree).

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>My friends think I should consume meat &amp; dairy replacements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What my friends think about my consumption is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My family think I should consume meat &amp; dairy replacements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What my family thinks about my consumption is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My colleagues/classmates think I should consume meat &amp; dairy replacements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What my colleagues/classmates think about my consumption is important to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q10. Please rate these statements on a scale from 1 (strongly disagree) to 7 (strongly agree).

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat &amp; dairy replacements are too expensive</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Expensive products make my purchase more unlikely</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Meat &amp; dairy replacements are not easily available at my regular grocery store</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>The poor availability of meat &amp; dairy replacement in the grocery store make my purchase more unlikely</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Information about meat &amp; dairy replacements is difficult to access</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>The accessibility of information about meat &amp; dairy replacements makes my purchase more unlikely</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>I cannot decide freely over what I consume in my household</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Not being able to decide freely over what I consume in my household makes my purchase of meat &amp; dairy replacements more unlikely</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>I don't like to try new foods</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>The fact that I don't like to try new food makes my purchase of new products more unlikely</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>I value the cultural and traditional aspect of food</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>The traditional aspect of food makes me more inclined to purchase</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
</tbody>
</table>

Q11. Gender
- Female
- Male
- Other

Q12. Age
- 10-15
- 16-20
- 21-25
- 26-30
- 31-40
- 41-60
- 60 and up
Q13. Occupation
   o Student
   o Working
   o Stay at home parent
   o Unemployed
   o Retired

Q14. Living situation
   o Alone
   o With partner
   o With partner & children
   o Single parent
   o With parents
   o With roommate(s)

Q15. Education
   o secondary school without diploma
   o secondary school diploma
   o some form of higher education
   o Bachelor
   o Masters
   o PhD
   o I prefer not to answer

Q16. How harmful do you think animal farming is to the environment?

<table>
<thead>
<tr>
<th>I don’t know</th>
<th>1, not at all</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7, very harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td></td>
</tr>
</tbody>
</table>
Q17. What is the monthly income of your entire household?

- 0-10,000 SEK
- 10,000-15,000 SEK
- 15,000-25,000 SEK
- 25,000-35,000 SEK
- 35,000-55,000 SEK
- 55,000 SEK and up
- I prefer not to answer

Leave us your email address if you want to receive the results and allow us to contact you with additional questions.
Appendix 3: Complete models

Equation 1

\[ B = BI(\omega_1) \]

Where:

- \( B \) = A specific behavior
- \( BI \) = Intention to engage in that specific behavior
- \( \omega_1 \) = Weight reflecting the influence behavior intention has on behavior
Equation 2

\[ B \sim BI = A_{act} (\omega_1) + SN (\omega_2) + Gender (\omega_3) + Age1 (\omega_4) + Age2 (\omega_5) + Age3 (\omega_6) + Age4 (\omega_7) + Age5 (\omega_8) + Age6 (\omega_9) + Occupation1 (\omega_{10}) + Occupation2 (\omega_{11}) + Occupation3 (\omega_{12}) + Occupation4 (\omega_{13}) \]

Where:

- \( A_{act} \) = Personal attitude towards engaging in that specific behavior
- \( SN \) = Subjective norm; It tells us whether the entourage of a person wants them to engage in that specific behavior
- \( Gender \) = Dummy variable of gender (Gender = 1 if female, 0 otherwise)
- \( Age1 \) = Dummy variable 1 of Age (Age1 = 1 if 16-20 years old, 0 otherwise)
- \( Age2 \) = Dummy variable 2 of Age (Age2 = 1 if 21-25 years old, 0 otherwise)
- \( Age3 \) = Dummy variable 3 of Age (Age3 = 1 if 26-30 years old, 0 otherwise)
- \( Age4 \) = Dummy variable 4 of Age (Age4 = 1 if 31-40 years old, 0 otherwise)
- \( Age5 \) = Dummy variable 5 of Age (Age5 = 1 if 41-60 years old, 0 otherwise)
- \( Age6 \) = Dummy variable 6 of Age (Age6 = 1 if 61 and up, 0 otherwise)
- \( Occupation1 \) = Dummy variable 1 of Occupation (Occupation1 = 1 if working, 0 otherwise)
- \( Occupation2 \) = Dummy variable 2 of Occupation (Occupation2 = 1 if stay at home parent, 0 otherwise)
- \( Occupation3 \) = Dummy variable 3 of Occupation (Occupation3 = 1 if unemployed, 0 otherwise)
- \( Occupation4 \) = Dummy variable 4 of Occupation (Occupation4 = 1 if retired, 0 otherwise)
- \( \omega_1 \sim \omega_{13} \) = Weights reflecting the relative influence each factor has on the behavior intention
Equation 3

\[ \text{B} \sim \text{BI} = \text{Aact} (\omega_1) + \text{SN} (\omega_2) + \text{Gender} (\omega_3) + \text{Age1} (\omega_4) + \text{Age2} (\omega_5) + \text{Age3} (\omega_6) + \text{Age4} (\omega_7) + \text{Age5} (\omega_8) + \text{Age6} (\omega_9) + \text{Occupation1} (\omega_{10}) + \text{Occupation2} (\omega_{11}) + \text{Occupation3} (\omega_{12}) + \text{Occupation4} (\omega_{13}) + \text{Income1} (\omega_{14}) + \text{Income2} (\omega_{15}) + \text{Income3} (\omega_{16}) + \text{Income4} (\omega_{17}) + \text{Income5} (\omega_{18}) + \text{Income6} (\omega_{19}) + \text{Education1} (\omega_{20}) + \text{Education2} (\omega_{21}) + \text{Education3} (\omega_{22}) + \text{Education4} (\omega_{23}) + \text{Education5} (\omega_{24}) + \text{Education6} (\omega_{25}) \]

Where:

Income1 = Dummy variable 1 of Income (Income1 = 1 if 0-15.000 SEK, 0 otherwise)
Income2 = Dummy variable 2 of Income (Income2 = 1 if 15.000-25.000 SEK, 0 otherwise)
Income3 = Dummy variable 3 of Income (Income3 = 1 if 25.000-35.000 SEK, 0 otherwise)
Income4 = Dummy variable 4 of Income (Income4 = 1 if 35.000-55.000 SEK, 0 otherwise)
Income5 = Dummy variable 5 of Income (Income5 = 1 if 55.000 SEK and up, 0 otherwise)
Income6 = Dummy variable 6 of Income (Income6 = 1 if I prefer not to answer, 0 otherwise)
Education1 = Dummy variable 1 of Education (Education1 = 1 if secondary school diploma, 0 otherwise)
Education2 = Dummy variable 2 of Education (Education2 = 1 if some form of higher education, 0 otherwise)
Education3 = Dummy variable 3 of Education (Education3 = 1 if Bachelor, 0 otherwise)
Education4 = Dummy variable 4 of Education (Education4 = 1 if Masters, 0 otherwise)
Education5 = Dummy variable 5 of Education (Education5 = 1 if PhD, 0 otherwise)
Education6 = Dummy variable 6 of Education (Education6 = 1 if I prefer not to answer, 0 otherwise)

$\omega_{14} \sim \omega_{25}$, = Weights reflecting the relative influence each factor has on the behavior intention

**Equation 4**

$$BI - B = CB(\omega_1) + GB(\omega_2) + IB(\omega_3) + AB(\omega_4) + PB(\omega_5) + FNB(\omega_6) + Gender(\omega_7) + Age1(\omega_8) + Age2(\omega_9) + Age3(\omega_{10}) + Age4(\omega_{11}) + Age5(\omega_{12}) + Age6(\omega_{13}) + Occupation1(\omega_{14}) + Occupation2(\omega_{15}) + Occupation3(\omega_{16}) + Occupation4(\omega_{17}) + Income1(\omega_{18}) + Income2(\omega_{19}) + Income3(\omega_{20}) + Income4(\omega_{21}) + Income5(\omega_{22}) + Income6(\omega_{23}) + Education1(\omega_{24}) + Education2(\omega_{25}) + Education3(\omega_{26}) + Education4(\omega_{27}) + Education5(\omega_{28}) + Education6(\omega_{29})$$

Where:

- BI – B = the gap between intention to engage in the specific behavior and that specific behavior
- CB = Cultural barrier; It tells us the importance of cultural and traditional aspect of food to a person
- GB = Gatekeeper Barrier; It tells us whether the person cannot freely decide over what to consume in the their household
- IB = Information Barrier; It tells us whether the information about meat & dairy replacements is difficult to access for a person
- AB = Availability Barrier; It tells us whether meat & dairy replacements are not easily available at regular grocery store for a person
- PB = Price Barrier; It tells us whether meat & dairy replacements are too expensive for a person
- FNB = food Neophobia Barrier; It tells us whether the person doesn’t like to try new foods

$\omega_{1} \sim \omega_{25}$, = Weights reflecting the relative influence each factor has on the behavior intention