Motives for Consumption of Meat and Meat Substitutes: Means-End Chain Analysis Using Laddering Method

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Affidavits

I hereby swear that I have compiled this Master thesis without external help and without using sources and aides other than those permitted and that the sources have been cited verbatim or quoted textually in the places indicated.

This work has not been submitted in the same or similar form to any other examiners as a form of examination. I am aware that offenders may be punished ('use of unauthorized assistance') and that further legal action may ensue.

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Kurzfassung

Fleisch ist seit Jahrhunderten ein Grundnahrungsmittel für viele Menschen und gilt als wertvoller Bestandteil einer ausgewogenen Ernährung. In den letzten 60 Jahren hat sich der durchschnittliche jährliche Fleischkonsum weltweit fast verdoppelt. Eines der Probleme im Zusammenhang mit einem raschen Anstieg ist die Nachhaltigkeit und der Tierschutz. Eine weitere große Frage ist die langfristige Auswirkung auf die Gesundheit, da die Internationale Agentur für Krebsforschung rotes Fleisch als wahrscheinlich krebserregend und verarbeitetes Fleisch als krebserzeugend für den Menschen eingestuft hat. Fleischersatz können zur Verringerung des CO2-Fußabdrucks sowie zur Verringerung des Konsums von rotem Fleisch und infolgedessen zu einem geringeren Risiko für Herzerkrankungen beitragen. Ziel dieser Forschung ist es, die Hauptmotive für den Konsum von Fleisch und Fleischersatz in Wien zu identifizieren und zu vergleichen.

Der theoretische Teil der Forschung bietet einen Überblick über die verfügbaren Fleischersatz und beschreibt deren Umwelt- und Gesundheitsvorteile. Die aktuelle Situation auf den globalen und österreichischen Märkten ist ebenfalls im theoretischen Teil enthalten. Da Fleischersatz vegetarische/vegane Produkte sind, sind auch die Motive für die Wahl einer veganen und vegetarischen Ernährung beschrieben.

Der empirische Teil beschreibt und bewertet Interviews mit zwei Verbrauchergruppen (jeweils 30 Personen): Fleisch und Fleischersatzkonsumenten. Laddering-Interview-Technik und Mean-End-Kettenanalyse wurden verwendet, um die Motive zu bestimmen. Geschmack und Gesundheit sind zwei Hauptmotive, die für beide Verbrauchergruppen gelten. Emotionales und körperliches Wohlbefinden ist auch ein wichtiger Grund für den Verzehr von Fleisch und Fleischersatz. Der Fokus der Fleischersatzkonsumenten liegt jedoch mehr auf ihrem emotionalen Wohlbefinden. Einige Fleischkonsumenten essen weiterhin Fleisch aus Gewohnheit oder Tradition. Das Hauptmotiv für den Verzehr von Fleischersatz ist der Tierschutz. Nachhaltigkeit spielt beim Verzehr von Fleischersatz eine wichtige Rolle. Fleischersatzkonsumenten essen die Produkte auch, um etwas Neues auszuprobieren und sich abwechslungsreicher zu ernähren. Dies ist neben dem Tierschutz für Flexitarierinnen einer der Hauptgründe.

Abstract

Meat has been a staple food for many people for centuries and is considered a valuable part of a healthy and balanced diet. However, in the last 60 years, the average annual meat consumption almost doubled worldwide. One of the concerns related to such a rapid increase is the sustainability and animal welfare of meat-containing diets and the negative impact of meat production on the environment. Another big question is the long-term health effect, as the International Agency for Research on Cancer classified red meat as probably carcinogenic and processed meat as carcinogenic to humans. Meat substitutes can contribute to the reduction of carbon footprint compared to meat production and also to the reduction of consumption of red meat and as a consequence to lower risk of heart diseases. The objective of this research is to identify and compare the main motives for meat and meat substitute consumption in Vienna, Austria.

The theoretical part of the research provides an overview of available meat substitutes and describes their environmental and health benefits compared to meat. The current situation on global and Austrian meat and meat substitutes markets is also included in the theoretical part. Since meat substitutes are vegetarian/vegan products, the motives for choosing vegan and vegetarian diets are described as well.

The empirical part describes and evaluates interviews of two consumer groups (30 people each): meat and meat substitutes consumers. Laddering interview technique and mean-end chain analysis were used to determine the motives. Taste and Health are two main motives that are valid for both consumer groups. Emotional and physical well-being is also an important reason for meat and meat substitute consumption. However, meat substitute consumers' focus is more on their emotional well-being. Some meat consumers continue to eat meat out of habit or tradition. The main motive for meat substitute consumption is animal welfare. Sustainability plays an important role in meat substitute consumption. Meat substitute consumers also eat the products to try something new and to have a more diverse diet, which is one of the main reasons besides animal welfare for flexitarians.

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Abbreviations

GHG	Greenhouse gas
WHO	World Health Organization
IARC	International Agency for Research on Cancer
PDCAAS	Protein digestibility-corrected amino acid score
CO_2 eq.	CO_2 equivalent
FAO	Food and Agriculture Organization
BSE	Bovine Spongiform Encephalopathies (),
OECD	Organisation for Economic Co-operation and Development
AMA	AgrarMarkt Austria
EU	European Union
MEC	Means-end chain
HVM	Hierarchical value map

1. Introduction

1.1. Problem description

Meat consumption has increased rapidly over the past decades in developed and developing countries (WHO, n.d). This trend can be explained by several aspects, such as population growth, income increase, and rising urbanization. There are, of course, quite a few concerns and questions, related to such an increase in the global meat consumption. At the core of the problem is the sustainability of such diets and their impact on the environment (FAO, 2018). The food industry contributes around 14 billion tonnes of CO2 equivalents to the global greenhouse gas (GHG) emissions, which is almost 30% of the anthropogenic GHG emissions. The livestock and fish farms sector represents 30% of the industry's GHG emissions (Poore & Nemecek, 2018).
Another important aspect of meat consumption is long-term health effects - how healthy are such diets? For instance, the number of obese people worldwide is three times higher now than 40 years ago. The number of people suffering from diet-related diseases such as diabetes, cardiovascular disease, high blood pressure, etc. increased as well (FAO, 2018).

Is it possible that increased meat consumption is contributing to these problems? To answer this question, we should consider what makes meat so attractive to consumers. First of all, it is assumed that meat is irreplaceable with regard to its nutritional and health benefits. Second, meat plays a key role in various Western cuisines (Elzerman et al, 2011). And finally, the taste and the texture of meat is a major factor why so many people are unwilling to reduce their meat consumption (De Backer & Hudders, 2014). However, there are people, who voluntarily cut meat out of their diet. One of the reasons is that meat production has a huge negative impact on our environment. A lot of people are also concerned about animal welfare. In Europe, for example, people are less accepting of large-scale livestock farming. Finally, people are also concerned about their health. In this context, it is worth highlighting that the International Agency for Research on Cancer (IARC) classified red meat as "probably carcinogenic" and processed meat as "carcinogenic to humans" (Weinrich, 2018; WHO, 2015).

There are a few motives for meat and meat substitute consumption that can be identified from the literature. However, most studies focus on the question why meat consumers are not willing to give up meat and not on their primary motives for meat consumption. It is also not clear what

consumer motives are determining for meat substitutes consumption compared to meat, and whether there are correlations between different food lifestyles and consumer attitudes towards meat alternatives. It remains unclear what kind of individual motives consumers have: do meat substitutes replace meat or just play an additional role in consumers' diet?

1.2. Aim of the master's thesis and research questions

The main goal of this master's thesis is to identify consumer motives for the consumption of meat and meat substitutes in Vienna, Austria. The state of the art of research on the motives for meat substitute consumption will be summarized in the theoretical part. The differences in the perception of meat and meat substitutes will be expounded upon as well. This will serve as a basis for comparing the consumption motives of two different target groups: people who consume meat substitutes and people who consume meat in order to determine to which extent their motives differ from one another.

The two target groups (meat substitute consumers and meat consumers), which consist of 30 persons each, will be interviewed in Vienna, Austria. The interviews will be analyzed using the means-end chain method.

The following research questions can be derived from the problem description and the goal of the master's thesis:

1. What motivates people to consume meat substitutes?
2. What are the perception differences of meat compared to meat substitutes in the eyes of the consumers?
3. What kind of benefits can meat substitutes offer compared to meat?
4. To what extent do non-vegetarians/ non-vegans consume meat substitutes and why?

1.3. Structure of the master's thesis

This master's thesis comprises two parts: theoretical and empirical. The theoretical part provides background information about the master's thesis topic as well as serves as a basis for the empirical part. The following chapter gives an overview of meat substitutes including definitions and describes non-animal-based proteins and other ingredients in the meat substitute products. It also describes the environmental and health benefits that meat substitute products

can provide compared to real meat. Chapter 3 provides an overview of the global market for meat and meat substitutes, as well as describes Austrian meat and meat analogues market. People's motives for choosing a vegan and vegetarian diet are described in Chapter 4. The method of means-end chain analysis and laddering interviewing technique, which is used for the empirical part of this master thesis, are described in Chapter 5.

In the empirical part of the master's thesis, the motives for consumption of meat and meat substitutes are assessed by using the method of a mean-end chain analysis and the laddering technique. The results of both consumer groups are shown as hierarchical value maps in Chapter 7. The method and the results are elaborated upon in the Chapter 8. The conclusions are drawn in the last chapter.

2. Meat Substitutes

2.1. Definitions

For further discussion, it is necessary to have clear definitions of meat and meat substitutes. Codex Alimentarius Austriacus (Austrian food book, 2013) defines meat as all parts of slaughtered warm-blooded animals that are suitable for human consumption. Hairs, hooves, claws and so on are not suitable parts and are not supposed to be consumed by people.

Meat substitutes are supposed to mimic the taste, texture and appearance of meat and also have the chemical properties similar to a certain type of meat. Meat substitutes come in various forms of known meat products, e.g. burger patties, nuggets, sausages, meatballs, fillings for tacos/burritos, etc. The main purpose of the meat analogues is to substitute meat in our diets. These products are not only marketed towards people with vegetarian or vegan diets but also towards people who want to reduce their meat intake or give up meat completely. Macronutrients of the meat substitutes are usually very similar to the real meat. The right selection of the base protein ingredients for meat substitutes plays an important role in mimicking meat products (Joshi and Kumar, 2015; Bohrer, 2019).

2.2. Types of protein sources in meat substitutes

One of the biggest challenges in producing meat substitutes is the achievement of meat-like texture and taste. The choice of a specific protein source can affect the texture and taste of the final product. Animal-based proteins consist of a certain combination of nine essential amino acids that can be sufficiently digested by humans. Plant-based proteins often lack one or more of the nine essential amino acids and are usually harder to digest compared to animal-based protein sources (Bohrer, 2019; Anzani et al, 2020). The protein digestibility-corrected amino acid score (PDCAAS) is a score that is used to assess the quality of proteins in foods by comparing the amino acid profile of a particular protein with the reference value. This simple calculation provides the amino acid score. This score is multiplied by the true digestibility of protein to get the final PDCAAS result which ranges from 0% to 100% or from 0 to 1. The highest PDCAAS of 1 means that the specific protein provides an acceptable combination of the nine essential amino acids. For example, the PDCAAS of egg white and milk is 1, while beef's score reaches 0.92. The PDCAAS evaluation method is recommended by the World Health Organization (Hughes et al, 2011).

What kinds of protein sources are available for meat substitutes? The overview of the most popular types of protein sources together with their advantages and disadvantages and PDCAAS can be found in Table 1.

Soy protein is the most known and the oldest alternative to meat. Tofu (soy product) has been a staple food in Asian cuisines for hundreds of years and gained its popularity in Western countries in the early 1960s (Sadler, 2004). The PDCAAS of soy protein (depending on the type of soy protein: flour, isolates or concentrates) ranges from 0.95 to 1, which is equal or sometimes even better than the score of animal-based protein sources like meat, dairy products and eggs (Bohrer, 2019; Golbitz & Jordan, 2006). Just as meat, soy protein is a great source of valuable vitamins (Anzani et al, 2020). As mentioned above, there are three types of soy protein: flour, isolates and concentrates. Depending on the type, soy protein can mimic the texture of such animal products as ground beef, poultry and seafood. However, soy protein has a very strong non-meat flavour (Joshi & Kumar, 2015). The extensive research on soy protein and its effects on human health showed that it can help to reduce blood cholesterol levels and to reduce the risk of cardiovascular disease (Asgar et al, 2010; Bohrer, 2019).

Cereals are one of the most valuable crops worldwide. Examples of cereals are rice, maize, whey, oats, etc. Depending on processing method cereal proteins come in different forms: seeds, flour and flakes. The protein percentage in dry matter differs from plant to plant and on average amounts to 10-15%, which is lower than in soy protein. However, cereal proteins are a valuable source of carbohydrates. They are usually combined with legume proteins to achieve a higher protein content (Asgar et al, 2010; Anzani et al, 2020). Cereal protein also has a lower PDCAAS of 0.59 compared to soy protein due to the absence of some main amino acids and lower digestibility. Furthermore, gluten can be found in cereal proteins and is an allergen for many people. It can be harmful to people suffering from celiac disease. One of the benefits of cereal protein that makes it so attractive to meat substitute producers is that it can mimic well the meat texture (Bohrer, 2019; Asgar et al, 2010). Another advantage is a high percentage of fiber, which is available in cereal proteins and cannot be found in meat (Popova & Mihaylova, 2019).

Legume proteins (peas, beans, lentils, etc.) have become more popular in meat substitutes production over the past few years. The PDCAAS ranges between 0.4 and 0.7, which is not as high as in soy protein or meat-based protein sources. However, legume proteins demonstrate reasonable amino acid content and therefore are usually used as a complementing ingredient

for meat substitutes, e.g. together with cereal proteins (Bohrer, 2019). Legume proteins also contain different healthy minerals and group B vitamins. The crops are quite cheap and, for this reason, legumes are a popular food in the diet of people from developing countries (Asgar et al, 2010). One of the biggest advantages of legume proteins (especially peas and chickpeas) is the ability to mimic the meat texture and simulate the meat-like building capacity of oils and water (Anzani et al, 2020). On the other hand, one of the limitations of legume protein's use is the fact that they contain antinutrients, which can have negative or positive effects on human health. According to the Oxford Dictionary of Biochemistry and Molecular Biology (2006), antinutrient intervene in the digestion of one or another nutrient. For example, antinutrients "α-amylase inhibitors" that are available in legumes can reduce sugar levels in people suffering from diabetes. On the contrary, some lectins that are available in legumes can increase the risk of gastroenteritis. Thankfully, there are quite a few available processing techniques to help eliminate the antinutrients in legume proteins (Abd El-Hady&Habiba, 2003; Asgar et al, 2010).

In the 1960s as a response to the growing population scientists were looking for an inexpensive way to produce a non-animal-based protein source. One of the sources considered was a filamentous fungus and an organism called Fusarium (F.) venenatum to produce mycoproteins (Hashempour-Baltork et al, 2020). Mycoproteins are a great source of proteins and contain about 45% of proteins in dry matter. PDCAAS ranges from 0.91 to 1, which is on the same level as soy protein and animal-based protein sources. It was also determined that the allergen potential of mycoprotein is lower compared to soya or eggs (Asgar et al, 2010). However, some consumers had an allergic reaction after consuming mycoprotein products (Finnigan et al, 2019). Mycoproteins show high content of fiber and protein, and low content of fat and sodium, which can be considered a perfect food for a healthy diet. Furthermore, they contain zinc and selenium, although iron content is low compared to meat. Clinical trials showed impressive results on how mycoprotein products could help to reduce cholesterol levels. But there are not enough studies that have been conducted to confirm these findings (Denny et al, 2010).

The PDCAAS of oilseeds proteins (sunflower, rapeseed, peanut, etc.) reaches 0.86, which is higher than PDCAAS of cereal and legume proteins (Anzani et al, 2020). Crops like sesame, sunflower and rapeseed can be found in ancients texts dated 3000-2000 years BC. Oilseeds are usually used for the production of oil, the "meal" (the rest of the seeds after oil extraction) provides a great source of proteins. Oilseeds proteins are also vitamin-rich, especially, vitamin E, niacin, iron and magnesium, and have a high fiber content (González-Pérez & Arellano, 2009). However, just like legume proteins, oilseeds proteins do not contain a great number of sulfur-containing amino acids. This, however, can be mitigated by adding cereal proteins or

mycoproteins to oilseeds proteins (Asgar et al, 2010). Another disadvantage is that oilseeds, especially peanuts and rapeseed are allergens and can cause a severe allergic reaction (Anzani et al, 2020).

Table 1: Advantages and disadvantages of different types of plant-based protein sources

Type of protein source	PDCAAS	Advantages	Disadvantages
Soy protein	0.95 - 1	– Low cost – Wide availability – High social acceptability – High-quality protein – A high content of fiber – A high content of vitamins (iron, calcium and vitamins B) – Reduces the risk of cardiovascular disease	– Strong non-meat flavor (bitter)
Cereal proteins	0.2 - 0.4	– A high content of fiber – Great source of carbohydrates – Can mimic the meat-like texture	– Contains gluten (allergen) – Low protein content – Low PDCAAS
Legume proteins	0.4 - 0.7	– A high content of fiber – Great source of carbohydrates – Can mimic the meat-like texture – High content vitamins B – Meat like building the capacity of oils and water – Contain antinutrients	– Contain antinutrients – Lack of sulfur-containing amino acids

Mycoproteins	0.91 - 1	– A high content of fiber – High content protein – Low content of fat and sodium – Source of Zink and selenium	– Could be an allergen for a very small percentage of people
Oilseeds proteins	0.86	– A high content of fiber – A high content of vitamins (iron, magnesium, niacin and vitamin E)	– Allergen – Lack of sulfur-containing amino acids

Source: Own representation based on Bohrer, 2019, Anzani et al, 2020, Joshi&Kumar, 2015, Asgar et al, 2010, Popova&Mihaylova, 2019, Abd El-Hady&Habiba, 2003, Hashempour – Battork et al, 2020, Finnigan et al, 2019, Denny et al, 2019, González-Pérez & Arellano, 2009

2.3. Non-protein ingredients in meat substitutes

It is not enough to find a good protein base for meat substitute. Meat also contains fats, which have a big influence on taste, texture, juiciness and overall the real meat taste, which is not possible to achieve by only choosing the right protein components. To better mimic the texture of meat, solid fats (e.g. coconut oil, cocoa butter) are mixed with liquid oil (e.g. sunflower oil, rapeseed oil, avocado oil). Modern technologies allow us to produce lipids for meat substitutes, which are very similar to the fat content of real meat (Sha & Xiong, 2020; Bohrer, 2019). The total part of fats in the meat substitute products reaches 15% compared to other ingredients in the list (Asgar et al, 2010).

There are almost no carbohydrates in the real meat; however, meat substitutes always have carbohydrate-rich ingredients. They are added in the form of flour, different types of starch or carrot/potato puree to improve texture. To imitate meat-like water and fat binding abilities such thickening/binding agents as methylcellulose, carrageenan, acacia gum, etc. are included in the production process of meat analogs (Sha & Xiong, 2020).

According to Resurreccion (2003), fat content and color of meat are perceived as the most important aspects by costumers. As we know, raw meat (red for pork/beef and whitish for poultry) and cooked meat have different colors due to chemical changes in myoglobin (a protein

responsible for color in meat). Meat substitutes' consumers would like to see a similar color of uncooked meat, as well as see color changes during cooking (Bohrer, 2019). Heme, a protein extracted from soy plants, is used, for example, in an Impossible burger to mimic blood in meat (Impossible foods, n.d.; Sha & Xiong, 2020). Other plant extracts such as beet juice (e.g. in Beyond Burger), tomato paste, red berries, etc. are used as well. However, it is very hard to achieve the wanted cooked-meat color in cooked meat substitutes. Overall, coloring extracts are accounted for around 0.5% of all ingredients in meat substitutes (Asgar et al, 2010; Bohrer, 2019).

Different flavors and seasoning are also added to the meat analogues to enhance the taste. The amount of seasoning (sugars, salt, garlic, soy sauce, different herbs, etc.) is usually higher in meat substitutes compared to the meat itself. Sometimes different flavors are added to the plant-based products to cover the "off-flavor" of soy or legume proteins. Usually, 3 to 10% (of all ingredients) of flavor enhancers are used in the meat analogues' final products (Asgar et al, 2010; Bohrer, 2019; Sha & Xiong, 2020).

2.4. Available meat substitutes

Soy products have been a staple food in Asian cuisine for several centuries but only became popular (as tofu) in Western countries in the 1960s. Back then tofu and textured soy protein were mostly consumed by vegetarians and did not have resemblances to meat regarding taste and texture. From a nutritional point of view, tofu is considered healthy because it contains fiber, iron, calcium, as well as high-quality protein. There is also no cholesterol in tofu, and it does not have a high number of calories (Elzerman, 2013; Sadler, 2004; Joshi & Kumar, 2015).

Later, in the 1980s a new meat alternative was introduced to the market – "Quorn", which had a mycoprotein base. These products became quite popular at first in the United Kingdom and afterward in the continental Europe, as well as in the United States. The main reason why the Quorn products were so loved by the public is that taste and texture were pretty close to the texture of chicken. They were also not marketed as vegetarian food but rather as a mainstream one (Elzerman, 2013; Sadler, 2004).

Tempeh is another highly socially accepted meat alternative. It is a fermented food made out of soybeans and is very popular in Asian cousin, especially in Indonesia. However, it gained recognition among vegetarians in Western countries in the 1970s. It is rather solid and thick and can be used as patties for burgers. Tempeh is also a great source of high-quality protein, vitamin B12 and fiber (Babu et al, 2009; Wang, 1984).

The start of the development of new meat alternative products using wheat and pea protein can be dated to the 1990s. This technique of combining two proteins allowed us to mimic different meat texture (poultry and beef). Such organizations as Impossible Foods (founded in 2011) and Beyond Meat (founded in 2009) are currently the biggest meat substitute providers. The Impossible burger patty is made of soy and potato protein with added heme (molecule extracted from soy plants, which is a great source of iron). Heme adds this real "taste of meat". The Beyond Burger patty is made of pea and rice protein with beet juice extract, which mimics the blood in the burger (Sadler, 2004; Impossible foods, n.d.; Beyond meat, n.d.).

Bohrer (2019) compared the nutritional composition of Beyond Burger, Impossible Burger with cooked real ground beef:

- Both meat substitute products have higher energy values and fat content compared to the real meat
- The protein content is higher in the real meat compared to meat analogues
- Ground beef has quite high cholesterol content (84 mg/100 g meat), while both meat substitute products contain 0 mg of cholesterol
- Impossible burger and Beyond Burger contain 7.96 g and 2.65 g of carbohydrates per 100 g "meat" respectively and there are 0 g carbohydrates in ground meat
- Both meat substitutes contain a small amount of fiber (on average 2g / 100 g product), while there is no fiber content in ground beef
- Lastly, the amount of sodium in meat substitutes products is much higher (around 336 mg/100 g product), than in ground beef (72mg/100 g meat)

2.5. Benefits of meat substitutes

2.5.1. Environmental concerns

Recently more and more people, especially in Western countries, started to think about the impacts of their diets on the environment, animal welfare and health (Westhoek et al, 2014). Production of food accounts for around 26% of anthropogenic greenhouse gas emissions. Within the food production chain, livestock and fish farms represent 30% of GHG emissions (Poore & Nemecek, 2018). Production of beef has the biggest impact on the environment out of all meat types and is responsible for around 41% of GHGs within the meat sector (FAO, 2013). Beef is accountable for about 50 kg of CO_2 equivalent per 100 g of protein (see Figure 1). Lamb comes second with 20 kg of CO_2 equivalent/100 g protein, followed by pork with around 8 kg of CO_2 equivalent/100 g protein. Poultry is the most environmentally friendly out

of all meat types, producing 6 kg of CO_2 equivalent/100 g protein (Poore & Nemecek, 2018). The livestock sector is also accountable for other GHG emissions, for example for 65% of anthropogenic N_2O and 64% of anthropogenic NH_3. The latter plays a big role in a higher amount of acid rains (FAO, 2006).

However, meat production is not only responsible for high emissions but also for land degradation. The livestock sector uses 30% of the productive land available on the planet. The livestock sector, especially, production of the feed for the animals, is also responsible for deforestation. For example, in South America, 70% of the forest is now gone due to farms and feedstock production. One of the biggest consequences of deforestation is the loss of biodiversity. The livestock sector is responsible for 20% of animal extinction and 30% of habitat loss. Another big environmental concern with regards to the livestock sector is the high consumption of water, as it is responsible for 8% of the total use of water (FAO, 2006). The use of water is higher in livestock production compared to crop production. Animals consume the feed crops, drink water and there is an additional usage of service water (Hoekstra and Chapagain, 2007). Hoekstra and Chapagain (2007) calculated the average use of water for some crops compared to different meat types. The most water intensive crop is rice with the average water footprint of 3000 m^3/t, which is lower than water footprint of poultry (3900 m^3/t), pork (4900 m^3/t) and beef (15500 m^3/t).

The ecological footprint is an important environmental indicator along water and carbon footprints. It "calculates the amount of biologically productive land (or sea) needed to supply the resources and absorb the emissions associated with a system of production" (BCNF, 2012a, p. 44). Beef has the highest ecological footprint of all products 109 m^2/kg, while pork and poultry have a bit lower ecological footprint of 28 m^2/kg and 25 m^2/kg respectively. For comparison, ecological footprint of rice is 12 m^2/kg. In an updated study published four year later, we can see, that ecological footprint for the same meat types increased quite drastically over the short time period. It is 146 m^2/kg for beef, 48 m^2/kg for pork and 44 m^2/kg for poultry. Interestingly, ecological footprint of rice decreased over time and amounts to 10 m^2/kg (BCNF, 2016).

Meat substitutes can contribute to the reduction of the carbon footprint of the meat industry. Smetana et al (2015) conducted a study by assessing the life cycles of meat substitutes. They found out that soy-based and wheat-based meat substitutes are the most environmentally friendly meat alternatives. Wheat-based meat substitutes produce around 1 kg CO_2 equivalent/100 g protein and soy-based meat alternatives are responsible for about 1.25 kg CO_2

equivalent/100 g protein (Fresan et al, 2019). According to Siegrist and Hartmann (2019), a lot of meat substitute consumers hesitate to buy soy-based products as they perceive soy production very harmful to the environment. Consumers do not differentiate soy feedstock production, which indeed has a negative impact on the environment and soy products for human use. According to the life cycle assessment of the Beyond Burger (Heller & Keoleian, 2018), production of Beyond Burger patty produces only 10% of the GHG of the normal burger patty and uses only half of the energy needed for the meat patty production. The overview of CO2-eq emissions of different meat and meat substitute types can be found in Figure 1.

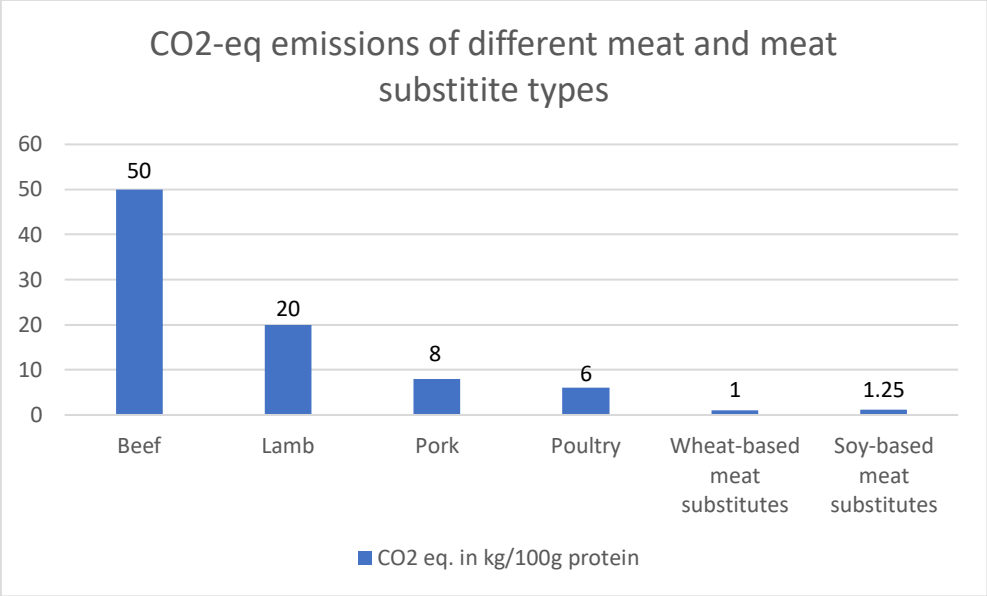

Figure 1: CO2-eq emissions of different meat and meat substitute types

Source: Own representation based on Fresan et al, 2019, Smetana et al, 2015, FAO 2006.

2.5.2. Health concerns

Meat is a great source of vitamins and minerals. It contains such important vitamins as B6 and B12, A, D and K, and such minerals as iron, zinc and copper. Iron and zinc are especially important for human health as there is a high amount of people with zinc/iron deficiencies (FAO, 1992). However, consumption of red and processed meat is much higher than the optimal dietary norms. Afshin et al (2017) assessed health effects of dietary risks from 1990 until 2017 and results showed that processed meat was consumed 90% more than the recommended norm. Consumption of red meat was also higher and exceeded the recommended amount by 18%. Only in African countries, red meat consumption was under the optimal dietary norms. The

highest amount of processed meat was consumed in North America, Western Europe and high-income Asian countries.

Why is the high consumption of red and processed meat are so concerning? The International Agency for Research on Cancer (2015), which operates under the World Health Organization, assessed the health impact of high intake of red and processed meat. They labelled red meat as "probably carcinogenic to humans" and processed meat as "carcinogenic to humans*"* in the context of developing colorectal cancer.

High meat intake can also increase the chances of such health problems and diseases as type 2 diabetes, obesity and coronary heart disease (Stubbs et al, 2018). Other risks, which are not proven but could be liked to meat consumption are include a possibility of getting Bovine Spongiform Encephalopathies (BSE), and digestion of drugs, pesticides and chemicals used in agriculture and detected in some meat parts with potentially adverse health effects (FAO, 1992).

What kind of health benefits can meat substitutes offer? Some of the health benefits were described in Table 1. For example, all described non-animal-based protein sources have a high percentage of fiber, which cannot be found in meat (Popova & Mihaylova, 2019). Clinical studies showed that consumption of soy protein can help reduce blood cholesterol levels and, therefore, reduce the risk of coronary heart disease. Some studies showed that mycoprotein can also help in reducing the level of cholesterol, but it has to be researched further. Adding mycoprotein to the diet showed much lower levels of glycemia for people with diabetes (Sadler, 2004). The main health benefit associated with meat substitutes consumption is related to lower intake of red meat and as a consequence lower risk of strokes and heart diseases. A decrease in the livestock sector also means that fewer antibiotics will be used in animals. Antibiotics in meat can have a negative impact on human health. The reduction of meat production would also mean an improvement for the environment as described above. Our health will only benefit from improved air and water quality (Westheok et al, 2014; Marshall & Levy, 2011).

3. Market for meat and meat substitutes

3.1. Global meat market

The average annual meat consumption worldwide almost doubled since 1961 and reached 35 kg per capita in 2018. More than 350 million tonnes of meat were consumed worldwide in 2018, with about 120 million tonnes in developing countries (ABARES, 2019). North America shows the highest per capita meat consumption - just under 100 kg/year, followed by Oceania (~70 kg/year) and Europe (~65 kg/year). An overview of worldwide meat consumption by the meat type is shown in figure 2. Poultry was the most consumed kind of meat in 2018 with average consumption 15 kg/person/year; pork is on the second place with consumed 12.5 kg/person/year; beef is on the third place with an average per capita consumption of 6 kg; and finally, only about 1.5 kg/person/year of lamb was consumed (OECD, 2019).

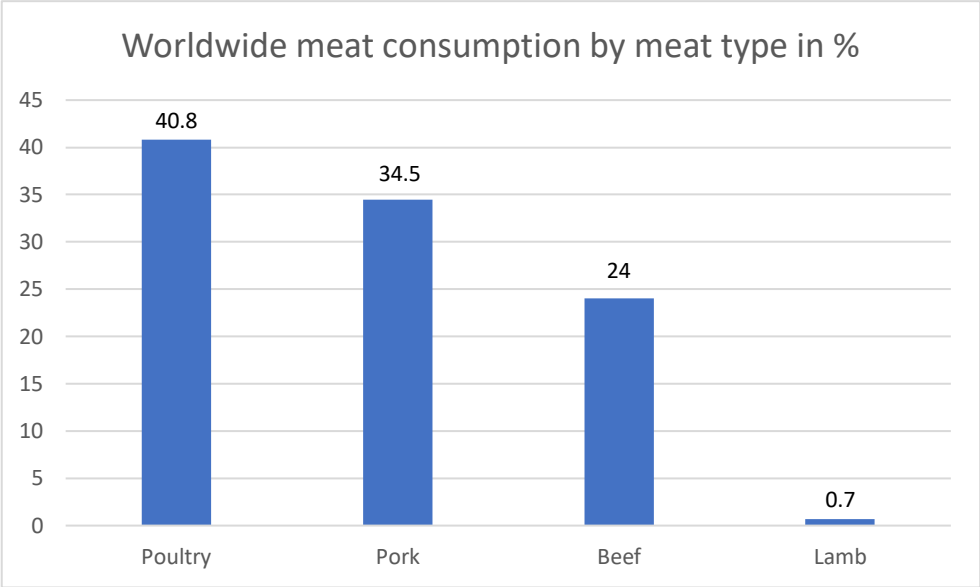

Figure 2: Worldwide meat consumption by meat type in 2018

Source: Own representation based on OECD, 2019

It is expected that meat consumption will increase by 12% until 2029. Despite that, the growth rate will slow down a little bit due to higher diet/health standards in developed countries and not so fast income increase in some parts of the world (OECD, 2020).

Meat consumption in developed countries will most probably stagnate in the coming years (Godfray et al, 2018). On the other hand, meat consumption will further rise in developing

countries. It is predicted that increase of annual meat consumption per capita in developing countries will be around 0.8%, which is two times higher than it was during the previous ten years. At the same time, the increase of annual meat consumption per capita in developed countries will be at 0.24%, which is only a quarter of the growth rate during the last decade (OECD, 2020).

However, it is important to consider changing consumer behaviour when assessing the future of meat consumption trends. Rising concerns about environment, animal welfare, health and use of antibiotics and hormones at the meat production stage change the consumer attitudes towards meat (Grunert, 2006). Consumer patterns slowly change in some countries and this could steer the market towards more healthy and sustainable foods. New companies enter the food market with innovative ideas on how to provide healthy and sustainable and at the same time affordable food (BCNF, 2018). Despite the growing interest towards healthier and environmentally friendlier food, the question remains, whether people would change their shopping behavior as well. In most cases, it is believed that the consumer attitudes influence their behavior only occasionally and not as often as expected. It can be explained by the fact that people know that meat production is not environmentally friendly and that animals are suffering; however, they do not know much else about the topics and, therefore, their attitudes do not influence the consumer shopping behavior (Grunter, 2006). Increasing interest in such topics as health, sustainability and animal welfare are important factors that can influence the meat market in the future. But it is difficult to assess the influence on the global meat market and the willingness to pay for more sustainable meat is not clear either. The affordability is still the main issue in developing countries (OECD, 2020). The increasing incomes in developing countries resulted in higher meat consumption per capita (BCNF, 2018). Another important aspect to consider here is the always changing and evolving technologies. As agrifood industry is trying to find new innovative ways to adapt to the changing consumer behaviors, new technologies could contribute to future meat consumption trends a lot (BCNF, 2012b).

Growing demand for meat is matched by the increase in production. The meat production reached 327 million tonnes in 2018, which is 1% higher than in 2017 (OECD, 2019). While earlier forecasts anticipated the highest increase in meat production in developing countries, especially in China and Brazil (Kearny, 2010), according to “OECD-FAO Agricultural Outlook 2019-2028” (2019), Brazil’s and China’s meat production trend decreased while the European Union, the United States, Russia and Australia demonstrated increase in 2018. The decline in meat production (pork production) in China is connected mostly to the epidemic of African Swine Fever. The political situation in Brazil (import embargo due to food safety regulations)

has caused a decrease in meat production in 2018. According to the FAO Food Price Index, the average meat price was 5.1% higher compared to the year 2018 (FAO, 2020). The biggest price increase can be seen in pork, as China's pork production decreased by 21% in 2019 (OECD, 2020).

Meat production is expected to continue with an upward trend until 2029. It is estimated that the worldwide meat production will reach 366 million tonnes by then, an 11% increase compared to 2018. Developing countries will account for the majority (around 80%) of further increased meat production (OECD, 2020).

3.2. Austrian meat market

Similar to other developed countries, the Austrian population is growing slowly (Leidwein et al, 2013). According to Statistik Austria (2019a), 8.8 million people lived in Austria in 2018. It is forecasted 9.2 million people by 2030 and 9.6 million by 2050. According to forecasts, Austrian population of elder people (65+) will increase from 18.8% in 2018 up to almost 30% by 2080. Austrians are significant meat consumers. For example, meat consumption per capita in 2015 was almost 65[1] kg/year, which is higher than the world's average meat consumption per capita for the same year (41.3 kg) (FAO, 2015). However, it is important to mention, that over the last two decades, meat consumption in Austria decreased from almost 69 kg/person/year in the year 2000 to 63.6 kg/person/year in the year 2018 (AMA, 2019). Despite this, the current consumption is still triple the amount, which is considered healthy (WWF, 2019).

Trends in meat consumptions in Austria in 2000-2018 are shown in Figure 3 below. Consumption of pork decreased from 42.8 kg per capita in 2000 to 37.2 kg/person/year in 2018. Beef consumption per capita showed a 1 kg reduction from 13.1 kg in the year 2000 to 12.1 kg in 2018. The only type of meat with increased per capita consumption is poultry, growing by more than 2.5 kg: from 10.2 kg in 2000 up to 12.5 kg in 2018 (AMA, 2019). The per capita consumption of lamb stayed the same – 0.8 kg (Statistik Austria, 2020a).

[1] These numbers relate to the meat for human consumption only.

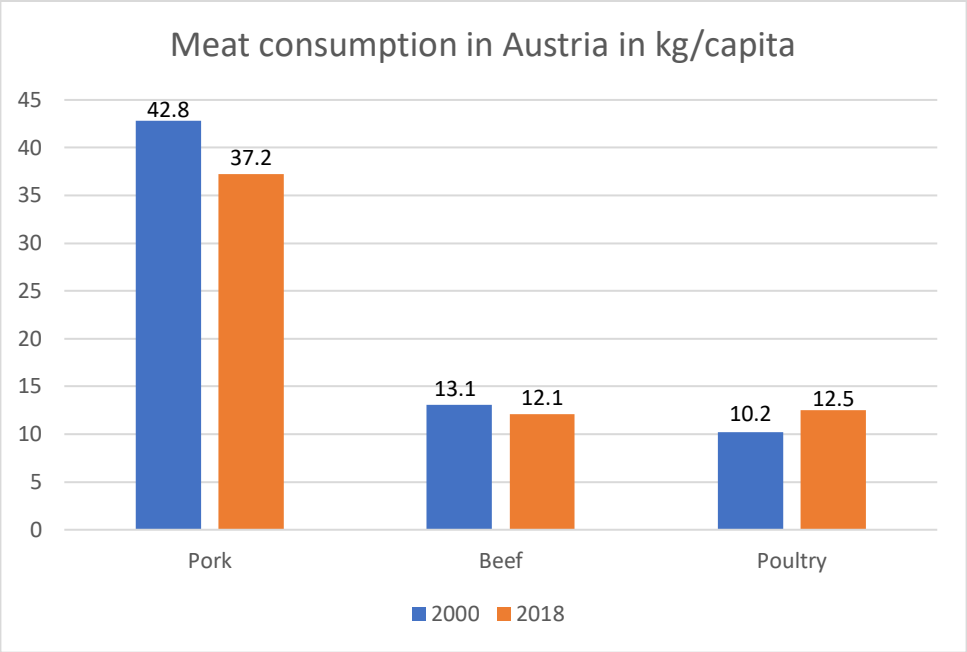

Figure 3: Meat consumption in Austria in kg per capita

Source: Own representation based on AMA, 2019

Austria produced 911.6[2] tonnes of meat in 2018, which is 1% higher compared to the previous year. The amount of meat produced in the land would be enough to cover 141% of the local population's need in beef consumption, 101% of pork consumption and 71% of poultry (Statistic Austria, 2019b).

Prices for pork increased from 1.72 euro/kg in 2013 to 1.77 euro/kg in 2019. Here is important to know that in 2014-2018 prices were lower than in 2013 but showed an 18% increase from 2018 to 2019. Beef prices decreased over six years period from 2.77 euro/kg in 2013 to 2.52 euro/kg in 2019. There was a 6%-reduction in beef prices compared to 2018. Prices for poultry decreased from 107.66 euro/100 kg in 2013 up to 100.85 euro/100 kg in 2019. However, the biggest decrease happened from 2018 (105.39 euro/100 kg) to 2019 (100.85 euro/100 kg) (Statistic Austria, 2020b). The price differences are shown in the Figure 4.

[2] The number relates to animals as a whole (incl. bones and fat).

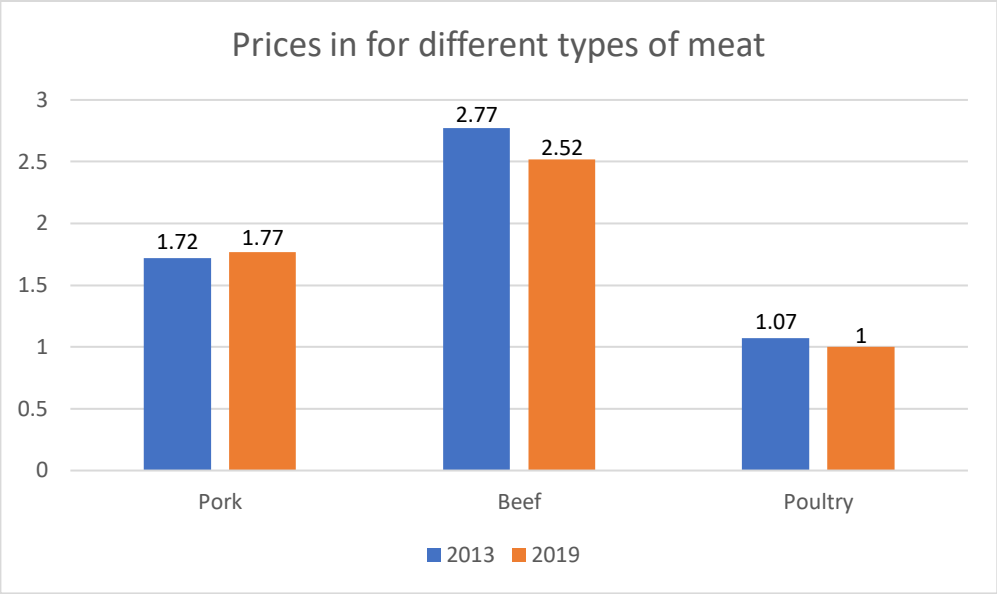

Figure 4: Austrian prices for different types of meat 2013 vs. 2019

Source: Own representation based on Statistic Austria, 2020

3.3. Global meat substitutes market

Meat substitutes are no longer targeted only at people with plant-based diets, i.e. vegetarians or vegans. They became more popular among all consumers who are trying to reduce their meat intake (PBFA, 2018). In the last three decades, investments in the meat alternatives industry reached almost USD 24 billion in the United States. Around USD 1.73 billion were invested in American plant-based companies in 2019 alone (GFI, 2019). According to Allied market research (2019), the meat substitute market is rising. In 2017, it generated USD 4.1 billion in revenue. In 2019, the revenue in the meat substitute market reached USD 4.8 billion. It is forecasted to almost double by 2026 and reach USD 8.1 billion. The growth of the plant-based meat substitutes segment is rapid. In 2017, sales of meat substitutes increased by 6% compared to 2016. In 2018, the sales grew by 24% compared to 2017. At the same time, the sales in the meat sector increased only by about 3% (PBFA, n.d).

The most consumed meat substitutes products are burgers, followed by patties and nuggets. Meatballs and bacon substitutes were not as popular and were placed the last. In the United States, beef-like plant-based products were more popular than pork and chicken in 2019 (GFI, 2019).

Overall, the most popular plant-based protein ingredients in meat substitutes on the market are soy-based. There are a few reasons for that: wide availability and high consumer acceptance, lower prices and great nutritional properties. Soy-based proteins are further used to create meat-

like taste and texture (especially of poultry), tofu and tempeh (Fortune Business Insights, 2019). Mycoproteins are in the second place, followed by wheat-based protein sources (Allied market research, 2019).

US-based meat substitute companies are also becoming popular in the European Union (EU). Incredible Burger launched its sales in Switzerland in 2019 and Beyond Meat is planning to begin manufacturing in Europe with a base in the Netherlands in 2020. Impossible Foods is also in the process to obtain an EU approval to sell its products within the EU. Retailers in the United Kingdom, like Aldi, Greggs, Marks & Spencer and Tesco came up with their own meat substitute products. Additionally, impossible Foods and Beyond Meat companies have expressed their intentions to start their productions in China in 2020 (GFI, 2019).

It is estimated that a soy-based meat substitute will continue to represent the biggest part of this market segment. Wheat protein is gaining popularity because of meat-like texture and the increasing number of people allergic to soy. Europe was the biggest meat substitute consumer, generating almost 40% of the total revenue in 2018. However, there is a growing interest in meat substitute products in Asian countries, especially in China, India and Japan due to economic development. It is expected for Europe to dominate the market until 2026 (Allied market research, 2019; Food Navigator, 2016).

3.4. Austrian meat substitute market

There is not a lot of information about the Austrian meat substitute market available. In 2005, only around 3% of the Austrian population were vegetarians (Vegane Gesellschaft, 2014). The number of vegetarians increased and reached 9% (765.000 people) by 2017 and about 1% of the population are vegans (80.000 people). This results in around 845.000 people (age 16 and older) who deliberately do not consume meat. Interestingly, the biggest group (22%) of vegetarians are young people age 16-29 and only 6% of all vegetarians are elder people age 60 to 69. Around 75% of vegetarians and vegans are women (Marktmeinungmensch, 2020). However, there are not only vegetarians and vegans but also flexitarians. This term came from the combination of two words: flexible and vegetarianism. Flexitarians usually consume vegetarian food but from time to time eat meat or fish (Derbyshire, 2017). In 2005, about 6% of the Austrian population were flexitarians. This number rapidly increased up to 26% in 2017, which is around 2.3 million people. Therefore, 36% or 3.1 million Austrians do not consume meat or consume it rarely (Marktmeinungmensch, 2020).

In 2016, around 290,000 tons of meat were sold in Austria, only about 0.5% or 1460 tones of meat substitutes are sold in the Austrian market (Die Presse, 2018). Despite that, 3% of all new vegan products that were launched worldwide in 2018, were produced in Austria (Europe and data journalism, 2019). Greenpeace conducted a study (2020) "Veggie - Grillen", where they examined nine Austrian supermarkets (Interspar, Merkur, Spar, Mpreis, Hofer, Billa, Unimarkt, Lidl and Pennymarkt) on the availability of meatless alternative for the products that people are usually buying to grill. The result showed that 77% of the grill products were also available as vegan options in all of the above-mentioned supermarkets.

Arbeiterkammer (2020) compared prices of the beef burger patty and meatless alternatives from 11 different veggie brands (see Table 2). Overall, average prices for meatless patties are 2 euro per 100 grams, which is 60% higher than the average price for beef patties. The most expensive meat substitute burger patty is Beyond Burger by Beyond Meat, which price is 112% higher than the classic burger patty's price.

Table 2: Comparison of classic beef burger patty and meat substitutes patties

Product	Price (euro/100g)	Protein ingredient	Fat ingredient
The classic beef burger patty	1.24	Meat	
Vegan burger by Garden Gourmet	1.99	Soy and wheat protein	Sunflower and rapeseed oil
Fan Burger by veggie Life	1.44	Soy and wheat protein	Sunflower and rapeseed oil
Burger Vegetables "red lentils" by SOTO Spezialitäten	1.87	Red lentils	Sunflower oil
Vegetarian Burger patty By Iglo Green Cuisine	2.50	Pea protein	Rapeseed oil
Burger with a pea protein base By Vega Vita	2.14	Pea protein	Sunflower oil and coconut butter

Incredible burger **By Garden Gourmet**	2.21	Soy and wheat protein	Sunflower and coconut oil
Beyond Burger **By Beyond Meat**	2.64	Pea and rice protein	Rapeseed oil and coconut butter
Burger **By Hofer Just veg!**	1.78	Pea protein	Coconut butter and sunflower oil
Juicy burger **By vegini**	2.14	Pea protein	Coconut and sunflower oil
Next Level Burger **by Lidl Next Level Meat**	1.32	Mushrooms, pea, wheat and soy protein	Coconut butter and rapeseed oil
Vegan burger patty **By Spar veggie**	1.54	Pea protein	Coconut and sunflower oil

Source: Own representation based on Arbeiterkammer, 2020

4. Plant-based diets and consumer motives behind them

4.1. Vegan diet

People with a vegan diet consume only plant-based products. They avoid animal-based foods, like meat, eggs, milk and dairy products and some people also do not consume honey. The vegan diet gained its popularity in the last few years, especially in Western countries. Interestingly, a typical person with a vegan diet is a young, well-educated, affluent woman who is invested in her health. The vegan lifestyle is not only about dietary restrictions but also about ethics and the environment. Vegans usually do not use products made of leather and fur (Richter et al, 2016). There are some great long-lasting health effects of a vegan diet described by Craig in 2009. People who do not consume animal products have lower chances of getting the following diseases: heart disease, obesity and diabetes. Some studies showed that people who are suffering from chronic illnesses could minimize their pain and side effects thanks to the vegan diet. However, there are some concerns in connection with vegan foods. There is evidence, that intake by vegans of vitamins D and B 12, iron, omega 3 and zinc are usually lower compared to people who eat animal-based products.

According to Janssen et al (2016), the motives behind the vegan diet are the following:

- Health concerns including weight-loss
- Ethical reasons (these mostly refer to concerns about animal welfare)
- Concerns about the environment
- Religion
- Taste

For most people, the main motives are health improvement and ethical reasons. Health concerns are increasing every year due to the high number of obese people and people suffering from different chronic diseases (Dyett et al, 2013). More information about conducted studies and people's motivation for choosing a vegan lifestyle can be found in Table 3.

Table 3: Consumer motives for choosing a vegan diet

Scholar and year	Name of study	Research method	Motives
Dyett et al, 2013	"Vegan lifestyle behaviors. An exploration of congruence with health-	Questionnaires were sent to 100 vegans in the US who signed up	- Health (47%) - Animal welfare (40%) - Religious beliefs (9%)

	related beliefs and assessed health indices"	for this research voluntarily	- Environment (2%) - Vegan family member (2%)
Kerschke-Risch, 2015	"Vegan diet: motives, approach and duration"	An online survey of 852 vegans in Germany	- Factory farming - Climate change - Health - Vegan friends
Radnitz et al, 2015	"Investigation of lifestyle choices of individuals following a vegan diet for health and ethical reasons"	An international online survey of 246 vegans	- Ethical reasons (201 people) - Health (45 people)
Waldmann et al, 2003	"Dietary intakes and lifestyle factors of a vegan population in Germany: results from the German Vegan Study"	Questionnaires were filled out by 154 vegans in Germany	- Health (75 people) - Ethical reasons (64 people) - Taste and aesthetics (7 people) - Hygiene (2 people) - Ecology (1 person) - Social (1 people)

Source: Own representation based on Dyett et al, 2013, Kerschke-Risch, 2015, Radnitz et al, 2015, Waldmann et al, 2003

4.2. Vegetarian diet

There are 3 main types of vegetarian diets (see Table 4). The most popular type of vegetarian diet is lacto-ovo vegetarian – people do not consume any kind of meat and meat products and avoid seafood and fish. Opposite to vegans, lacto-ovo vegetarians consume dairy products and eggs. There are also lacto - vegetarians who consume milk and dairy products but cut out eggs, and ovo-vegetarians who, on contrary, consume eggs but avoid milk products (Corin & Papadopoulos, 2017). Health benefits of a vegetarian diet are the same as in the vegan diet: lower risk of heart diseases, obesity and diabetes. However, the risks of iron and zinc deficiencies, as well as lower levels of vitamin B12 and D are still higher compared to people, who consume meat. There is also a connection between a vegetarian lifestyle and eating disorders. A lot of people choose to reduce their meat intake due to weight loss goals and can have a higher risk of developing an eating disorder (Petti et al, 2017).

As already mentioned, a flexitarian diet, with its definition included in the Oxford English Dictionary in 2014, includes consumption of primarily plant-based products but also from time-to-time consumption of meat and seafood products. This diet is supposed to combine the benefits of reducing meat intake, like health improvement (with regard to lower risk of heart diseases, diabetes and obesity), animal welfare and environment, and consuming meat for vitamins and minerals and adequate protein intake (Derbyshire, 2017).

Table 4: Types of vegetarian diets

Types of vegetarian diet	Do consume
Lacto-ovo vegetarian	Plant-based products, dairy products and eggs
Semi-vegetarian	Plant-based products, dairy products, eggs, poultry and fish
Pesco-vegetarian	Plant-based products, dairy products, eggs, and fish

Source: Own representation based on Fox & Ward, 2008

According to Rosenfeld (2018), these are the main motivations for people to choose a vegetarian diet:

- Health improvements
- Weight loss
- Ethical reasons (animal welfare)
- Environment

People with health motivation rather than ethical reasons or concerns for the environment usually follow a pesco-vegetarian diet, as fish is a great source of omega 3 and its consumption is included in the dietary norms of a healthy lifestyle (Rosenfeld & Tomiyana, 2019). Table 5 provides an overview of more conducted studies about the motives of a vegetarian diet.

Table 5: Consumer motives for choosing a vegetarian diet

Scholar and year	Name of study	Research method	Motives
Fox & Ward, 2008	"Health, ethics and environment: A qualitative study of vegetarian motivations"	33 vegetarians were interviewed using open questions. 18 follow up interviews	- Ethical reasons (45%) - Health reasons (27%) - Environment (1%)

			- Mixed reasons (taste, smell, look, religion)
Hoffman et al, 2013	"Differences between health and ethical vegetarians. Strength of conviction, nutrition knowledge, dietary restriction, and duration of adherence"	Online survey with 292 vegetarians from the USA	- Ethical reasons (234 people) - Health reasons (58 people)
Hamilton, 2006	"Eating Death"	Survey with 125 vegetarians in 1992/3	- Health reasons - Moral reasons - Mixed reasons, e.g. social, ecological and economical
Rozin et al, 1997	"Moralizing and Becoming a Vegetarian: the Transformation of Preferences and the Recruitment of Disgust"	Questionnaires with 104 vegetarians	- Health - Moral - The appeal of the vegetarian lifestyle - Disgust to meat - Ecology

Source: Own representation based on Fox&Ward, 2008, Hoffmann et al, 2013, Hamilton 2006, Rozin et al, 1997

5. Research methodology

5.1. Means-end chain approach

The means-end chain (MEC) theory is used in marketing to analyse consumer behaviour. It is believed that consumers buy products not because of the product itself but rather based on the assumption of what self-relevant impact a consumer can get out of this exact product (Mulvey et al, 1994). According to Olson and Reynolds (2001, p.9), there are seven assumptions why customers decide to buy one or another product:

1. **Problem Orientation:** people have enough stress and problems in their day-to-day life and by deciding to buy a specific product they are trying to achieve their goals/meet their needs in a problem-oriented matter;
2. **Focus on Consequences:** by buying a product, the customer expects to not only get a specific product but also get the consequences (outcome) out of it. These consequences can either help to achieve the goal or be a small step in achieving a bigger goal;
3. **Positive and Negative Consequences:** when people decide to buy a product, they are expecting to maximize their positive outcome and minimize the negative experience;
4. **Types of Consequences:** we can differentiate two types of consequences: functional and psychosocial. Functional consequences are concrete and quick, which usually happen in a short period after buying/consuming the product. For example, no hunger after eating a chocolate bar. On the other hand, psychosocial consequences relate to individuals' emotions and experiences. These consequences can happen much later after the product was bought. For example, the feeling of confidence in an older dress;
5. **Linkages or Connections**: the connection between the elements of the means-end model (attributes, functional and psychosocial consequences, and value) are very important for the approach;
6. **Personal Relevance:** functional and psychosocial consequences help to identify what are the underlying values and intentions in a person's life and play an important role in connecting these consequences to the end value in the means-end model;
7. **Intentional Conscious Decision Making:** the idea behind the means-end approach that a customer decides to buy a product "voluntary and conscious".

So, the main idea of the "means-end approach" is the assumption that consumers choose a product (means) to achieve a valued outcome (end) (Costa et al, 2004).

There are four key elements in the standard means-end model, which are linked as follows together (see Figure 5):

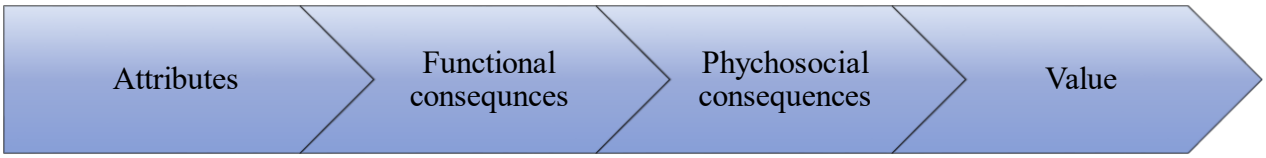

Figure 5: Standard means-end model

Source: Own representation based on Olson & Reynolds, 2001, p.13

Attributes refer to the product's qualities, for example, colour, size, taste, etc. They are a qualitative and not quantitative representation of a product. Attributes alone cannot explain why consumers decide to buy this specific product. Functional and psychosocial consequences were explained above – perceived as an additional outcome (experience) of what the product's benefits can help the customer to achieve. The main goal of the purchase is to get an outcome (value), which is desired by a concrete buyer. The value in this context is usually something immaterial, like a lifelong dream (Audenaert & Steenkamp, 1997; Keuper, et al, 2008).

It has been found that the means-end approach helps not only to explain consumer's decision-making process to buy a specific product but also to understand the patterns of customer behaviour (Audenaert & Steenkamp, 1997; ter Hofstede et al, 1998).

5.2. Laddering method

The laddering method is a frequently used technique to identify "consumers' means-end chains" (Reynolds & Olson, 2001). It is a qualitative semi-structured interviewing technique that helps to understand the connections between attributes, consequences and value of the means-end model. The main idea of such a laddering technique is to go in-depth with a "why" question. For example, "why is that important to you?". This kind of question continues until the interviewed person does not have anything else to add to the previous answers (Reynolds & Gutman, 1988; Reynolds & Olson, 2001; ter Hofstede et al, 1998).

There are three steps in the laddering method (Miles & Rowe, 2004):

1. Elicitation of important product's attribute
2. Laddering interview
3. Analysis and description of the interview's results

The last step is usually done by creating a hierarchical value map, which summarizes the interviews and shows the connection between attribute-consequences-values across the consumer group (Leppard et al, 2004).

5.2.1. Elicitation of important product's attribute

The first step in the laddering interview technique is to elicit the most important attributes of a product for this consumer. An interviewer helps to identify the differences in attributes perceived by this consumer between a product of study and another product from the same category (Costa et al, 2004; ter Hofstede et al, 1998).

There are five main techniques identified by Bech-Larsen et al in 1997 (p.3):

1. **Triadic sorting:** this method was developed by Kelly (1955) as a part of the Repertory Grid procedure. An interviewee is presented with three types of a product from one category (e.g. chocolate) and has to identify similarities between two out of three products and how they are different from the third one. For example, an interviewee says two out of three chocolates are sweet and the third one is bitter. Therefore, the interviewer identifies "sweetness" as a product attribute (Bech-Larsen et al, 1997; Miles & Rowe, 2004);
2. **Free sorting:** different products are presented to the interviewee. The interviewee should group these products and tell what are the similarities between the products within one group and what are the differences between the groups. This method is very similar to the triadic sorting; however, the interviewee can choose as many groups as (s)he wants with any number of products within the group;
3. **Direct elicitation:** the interviewee is asked to name the most important product's attributes for him/her;
4. **Ranking:** interviewee has to come up with a list of products ranked from the most preferred one to the least preferred. After that, s(he) should explain why (s)he preferers item 1 to item 2 and so on;
5. **Attribute list:** the list with attributes is usually generated based on a previous qualitative study. An interviewee should pick the most important one(s) with reference to the study object.

The choice of the technique depends on the particular study and study objects (Miles & Rowe, 2004).

5.2.2. Laddering interview

The interview itself is the second step after identifying the most important attributes of a product (ter Hofstede et al, 1998). The attributes provide the basis for ladders and the "why-questions". The interviewee is asked "why is this attribute important to you?" about every attribute until the interviewee does not have any answers or the needed information has been already obtained (Miles & Rowe, 2004).

There are two different types of laddering interview techniques: soft and hard. During soft laddering interviews, the flow of free speech of a participant should be encouraged and if possible interrupted rarely by the interviewer. This technique should prevent the interviewer's influence on the participant's answers (Costa et al, 2004). The participants can talk as much as they want highlighting positive and negative aspects of a product. Soft laddering interviews usually provide an extensive and full means-end model with comprehensive links between the elements to explore the consumer motives (Miles & Rowe, 2004). This type of laddering interview, including the analysis after the interview, takes a lot of time and is not suitable for studies with a very high number of participants (Langbroek& de Beuckelaer, 2007).

On the other hand, there is a hard-laddering interview. It is conducted with the help of a structured survey/questionnaire and does not involve the free flow of speech. This technique is more appropriate when the number of participants is quite high and the intricacy behind the consumer motives is considered low (Costa et al, 2004; Langbroek& de Beuckelaer, 2007).

Sometimes, when participants are not very familiar with the topic or a product, soft laddering interviews do not provide such complex and comprehensive results as anticipated. The familiarity with the topic is an important criterion to be considered before choosing the interview technique (Miles & Rowe, 2004).

There are two points during the interview that can become issues. The first one is that the participant does not have an answer or does not know the answer. The consumers may have never really thought about the attributes of the product and why specific attributes are more important for them than the other. In this situation, a negative laddering technique can be used. Questions relate not to "why do you choose this product over the other one?" but rather "why would you not choose the other product? What does the other product not have that the one you chose has?" (Reynolds & Gutman, 2001).

The other issue is that the topic may become too delicate and personal. The topic of the interview can become very personal, as the participants talk about the importance of product

attributes and why exactly these attributed are important to them. It can lead to a change in the subject or silence. The interviewer can try to talk about the subject in third person manner or share (can be fictional) facts about him/herself to try to make the participant feel better (Reynolds & Gutman, 2001).

5.2.3. Analysis and description of the interview's results

The interview can be recorded (if agreed with the participant), notes of the interview can be written down or a graph with the important information can be drawn during the interview. The analysis of the interviews can take a long time. There is a software "LadderMap" that helps to produce implication matrix and hierarchical value map (Miles & Rowe, 2004).

First of all, to be able to analyse the interviews, a set of codes has to be created. The interview answers should be grouped into three fundamental levels: Attributes, Consequences and Values. After that, the researcher creates codes for the answers within the levels. It is important here not to create very broad and long codes' names. Otherwise the point of the answers could be lost (Reynolds & Gutman, 2001). The number of codes within the levels should not be too excessive. For example, "I don't like the taste" and "I like the taste" can be coded as "taste" and so on (Costa et al, 2004).

The next step of the analysis is to create an implication matrix, which generates a visual representation of interviews. This step is a quantitative one and not qualitative as a previous one (Costa et al, 2004). The implication matrix is a square table and the size of it depends on the number of codes that will be represented. Normally, it ranges from 30 to 50 codes. Each code from the previous step gets a number or a letter. Then the numbers/letters are put into the column and row (row can consist only of consequences and values). The matrix shows how often one of the codes in the column is connected to the codes in the row. There are two different kinds of connections that are shown in the matrix: direct and indirect (Reynolds & Gutman, 1988). For example, there are five codes A-B-C-D-E. The direct connections are between A and B, B and C, C and D, and D and E – one code leads to another one, without any interventions. On the other hand, there are also indirect connections that are also important to consider while analysing the results. Indirect connections are the ones that lead to each other but have one or more elements between them. For example, A and C, A and D, and A and E, etc. have indirect connections (Reynolds & Gutman, 2001). As mentioned above, the matrix shows how many times the codes from the column are directly and indirectly connected to codes from the row (see Table 6). The number "2.1" means that there are two direct connections

and one indirect connection between code “1” and “2” (Miles & Rowe, 2004; Reynolds & Gutman, 1988)

Table 6: Example of an implication matrix

	Code 1	**Code 2**	**Code 3**
Code 1		2.1	0.2
Code 2	5.3		2.4
Code 3	0.3	3.1	

Source: Own representation based on Miles & Rowe, 2004 and Reynolds & Gutman 1988

The implication matrix is further used to create a hierarchical value map (HVM). The HVM can show the direct and indirect connections between the elements. However, sometimes it is impractical to include all indirect connections, as it is a very time-consuming analysis (Costa et al, 2004; Grunter, 1995). It is important to decide the cut-off levels (how many connections should be available to be included in the HVM) for the HVM (Miles & Rowe, 2004). According to Reynolds and Gutman (1988), as a rule, starting from 3-5 connections with the sample size between 50 and 60 people should be included in the HVM. The idea is to clearly illustrate the most important linkages. The HVM should be easily readable and understandable. Therefore, crossed lines should be avoided. Different thickness of connecting lines can be used. For example, the thicker the line connecting two different elements is, the more there are people associated these elements (Miles & Rowe, 2004; Reynolds and Gutman, 1988). The principle of non-redundancy influences the final illustration of HVM and, therefore, the interpretation of the results. It means that if there are more or less the same amount of direct and indirect connections, it is more likely that only direct linkages will be shown in the HVM (Costa et al, 2004).

The hierarchical value maps provide a great basis for practical applications. Marketing of a specific product or brand for customers based on their values and intentions. HVM is also a great support tool in creating advertising campaigns for the brand or for assessing the advertising campaigns of the competitors (Reynolds and Gutman, 1988).

6. Material and methods

6.1. Execution of interviews

According to Reynolds and Olson (2001) at least 20 people should be interviewed from each subgroup in order to provide representative results. Therefore, it was decided to survey 30 people from each consumer group. Interviews regarding the motives for the consumption of meat and meat substitutes took place between 29 September and 5 November 2020. It was not an easy task to conduct 60 interviews and find suitable interviewees due to the fact that interviews were time-consuming and quite a big number of interview partners were necessary. Another obstacle in the search for the right interview candidates was the worldwide pandemic and therefore, the search in public places was out of the question.

It was not that difficult to find meat consumers who were willing to participate in the interviews. At first, acquaintances, friends and colleagues were interviewed. Later, using the snowball principle, friends and acquaintances asked their parents, siblings and colleagues to participate in this study. One of the goals on this stage was to avoid the possible shortcoming of the method, e.g., to have similar people with similar interests and therefore similar motives. It was important to find people of different ages and backgrounds to have a representative sample for the research.

The search for interview partners who consume meat substitutes was more difficult. As mentioned in the theoretical part, only 10% of Austrian population are either vegetarians or vegan. However, they do not necessarily consume meat substitutes. At first, acquaintances and friends who consume meat substitutes were asked to participate in the interviews. The same snowball principle was used here to gain more interview partners. Facebook groups were used as well but the search there was not as successful as anticipated. Only two meat substitute consumers from Facebook group “Wien Vegan” were willing to participate in the interview.

Most interviews took place via Skype or Whatsapp with video due to social distancing rules during the pandemic. A few conversations took place face-to-face. There were no quality differences between video and face-to-face interviews. Interviewees were open to answer questions and explained their answers even to the closed-ended questions. Interviews usually lasted between 13 and 27 minutes. Interestingly, interviews with people who eat meat took longer than with interviewees who consume meat substitutes. The meat substitute group said that they have already thought many times about why they eat meat alternatives and did not

have to think about their motives during interviews. This was not the case for meat consumers many of who have not thought about why they eat meat.

Two questionnaires were created for both target groups: meat and meat substitutes consumers. The structure of these questionnaires was identical, but one questionnaire was targeted towards meat consumers and the other towards meat substitutes consumers.

6.2. Interview participants

The requirement for participation in the interviews was the regular consumption of either meat or meat substitutes. At first, the main question before interviews for the group "meat substitutes" was their diet (vegan/vegetarian or flexitarian). That quickly changed after a few participants, who were either vegetarian or vegans, said they do not consume meat substitutes at all. Flexitarians were questioned under the group of "meat substitutes", as they mainly eat plant-based meals.

60 men and women between the ages of 19 and 65 with residency in Vienna were picked for participation in the interview. Out of 60 participants, 30 people were questioned about meat consumption and 30 about meat substitutes.

Gender diversity in participants was one of the goals before conduction the interviews. This was not a problem for meat-eaters. However, the meat substitute group was dominated by women and gender diversity within the group was not achieved.

6.3. Interview process

In the first place, the question about the consumption of meat or meat substitutes was asked with a few exceptions at the beginning of interviews (as mentioned above). The interviews began after participants confirmed either via text or orally that they are willing to participate in the interviews. In the first minutes of the interview, there was a brief introduction to the topic of the research and the interview technique. It was also pointed out that the interview is anonymous and will not be recorded. The answers to the interview were written down in the questionnaires during the interview. Additionally, it was said that there are no correct or incorrect answers to the questions and the same answers can be given more than once, if applicable.

The questions for the interview were based on the knowledge gained from the theoretical part of this master thesis with laddering being the most important part of the interviews. Both questionnaires can be found in the annex I. The laddering begins with the question to name the

most important characteristics of the meat or meat substitutes that motivate participants to consume the products. The direct elicitation technique was used in this part of the questionnaires (see Chapter 5.2.1.). After that, the participants were asked to rank properties of the products, from most to least important. Interestingly, after pointing out that the attributes shall be ranked, most interviewees listed their answers in a different order than in the question before. The "why" questions were asked in order to determine the consequences and values of the consumers.

Another important part of the interviews was the association test. Participants were asked to name everything that comes to mind when they think of meat or meat substitutes. After conducting a few interviews, it was decided to additionally point out verbally that the associations can be both positive and negative. Both consumer groups named more associations after adding this note.

The goal of the last six questions was to gather the sociodemographic information of the participants regarding age, education, income, household size, household members and gender.

Table 7 provides an overview of aim of the questions, as well as questions' type that were included in the questionnaires.

Table 7: Aim of the interview questions

Question	**Aim of the question**	**Type of question**
Consumption and frequency	Filter questions for the participation in the interviews	Closed-ended questions
Triggers for meat/meat substitutes consumption	Determination of the triggers (if any) for meat/meat substitutes consumption	At first closed-ended question. If the answer "yes" – open-ended question
Types of consumed meat/meat substitutes	Determination of consumed meat/meat substitutes types	Open-ended question
Animal products/ plant-based food alternatives	A determination whether meat-eaters also eat other animal products	The closed-ended Question followed by an open-ended question

	A determination of whether a consumer of meat substitutes also consume other plant-based food alternatives	
Purchase of meat/meat substitutes	Determination where the consumers buy the products	Closed-ended question
Consumption of meat (for meat substitute group) and meat substitute (for meat group)	The question relates to whether meat consumers also consume mat alternatives and vice versa. Explanation of the answer (yes or no) followed the question	The closed-ended question followed by an open-ended question
Desired characteristics	The goal of the question was to find out what properties of meat/meat substitutes are desired in meat (for meat substitute group) and in meat substitutes (for meat group)	Open-ended question
Information about meat/meat substitutes	Determination of the source of information about meat/meat substitutes properties	Closed-ended question
Contribution of meat and meat substitutes	The contribution of meat and meat substitutes to physical and emotional well-being.	Scale question
Type of the diet	The diet of the participants	Closed-ended question

Source: Own representation

6.4. Interview analysis

6.4.1. Laddering interviews

At first, attributes, consequences and values for both consumer group were identified. Only key words were used for these categories in order to better present the results. The ladders were then filled out in the program (LadderUX) using the three categories, mentioned above.

Implication matrices and Hierarchical Value Map (HVM) for both target groups were also created in the program (LadderUX). Based on the HVM from the LadderUX, the HVMs were later created in Microsoft PowerPoint for a better overview. The implication matrices can be found in the Annex II.

6.4.2. Association test

The answers to the association tests from the interview were also categorized by different topics and represented graphically as a semantic network in Chapter 7. Additionally, the associations were also divided into positive, negative and neutral associations. The graphic was made in Microsoft PowerPoint.

6.4.3. Additional questions

The additional questions from the interviews about meat and meat substitutes were analyzed in Microsoft Excel and represented graphically for a better overview. The additional questions relate, as described above, to types of meat/meat alternatives, consumption of meat and meat alternatives in general, the place of purchase, information source, desired properties, type of diet and additional sociodemographic questions.

It is important to mention here that this is a qualitative study with small sizes of both target groups. Based on this, the results of the interviews are not representative of all citizens in Vienna and in Austria and cannot be generalized. The results of the interviews provide a basis for the hypothesis about the values and motives of meat and meat substitutes consumers in Austria. This master thesis could also be used as a basis for a bigger qualitative or quantitative study.

7. Results

7.1. Meat

7.1.1. Sample description

This chapter describes the sociodemographic data of the 30 interview partners who consume meat (an overview can be found in Table 8). Figure 6 shows the age and gender distribution within the group of meat-eaters. Among the interviewees 57% were women and 43% men. The age category between 26 and 35 years is the biggest group of interviewed people with 30%, followed by the category between 36 and 45 years (27%). Two categories are equally represented with 13% in this sample group: 15 to 25 and 46 to 55. And 17% of all interviewed people are between the ages 56 and 65.

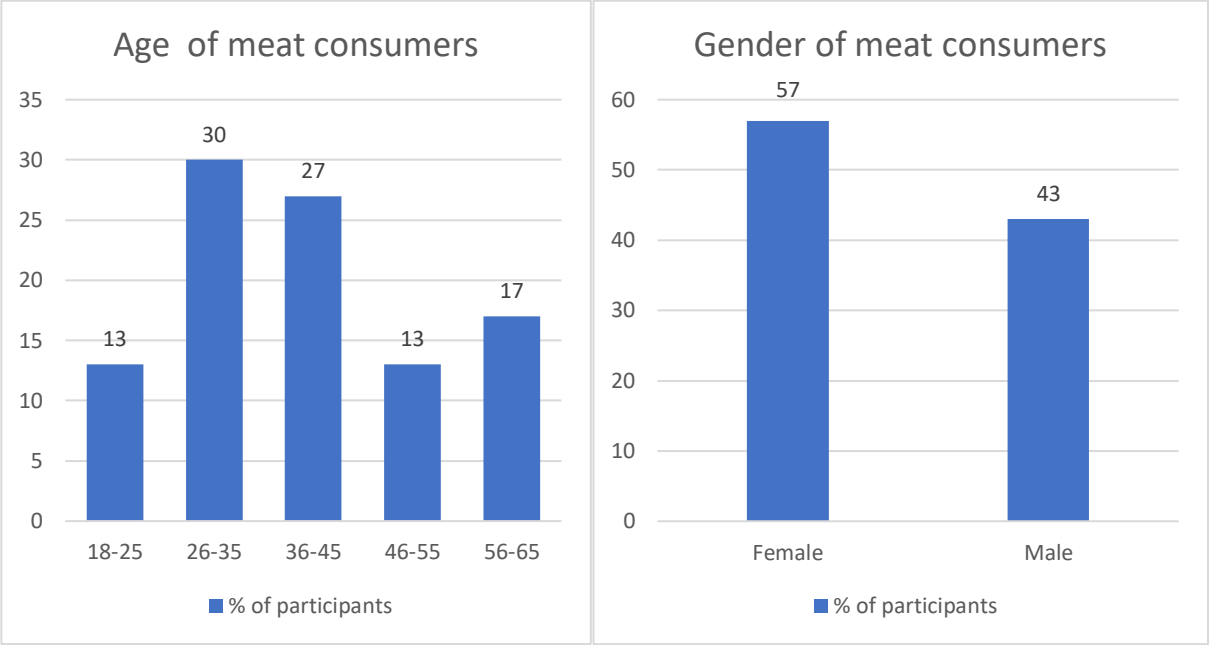

Figure 6: Age and gender of meat consumers (n=30)

Source: Own representation

The education level of people who consume meat is in Figure 7. Overall, the biggest part of participants has a university degree. 37% of the interviewees only graduated from high school, around 3% have only compulsory school education. And also 3% have a completed apprenticeship.

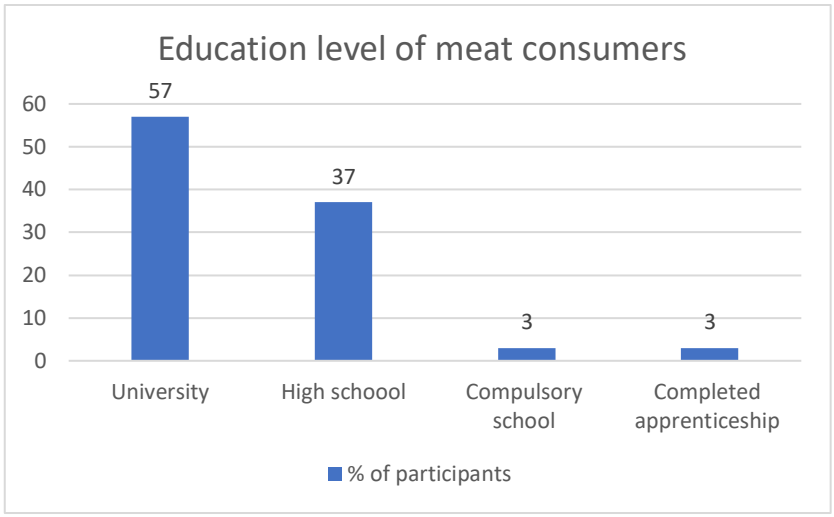

Figure 7: Education level of meat consumers (n=30)

Source: Own representation

Figure 8 shows the distribution of household size and household members of the interviewed people. 37% of all interviewees live in a two-people household, followed by a single group with 27%. In the third place (20%), there are people with four-people household and 16% of interviewees have 3 people living in their home. The three biggest groups within the category "household members" live either alone, with family/children or with their partner. 12% of asked people live in a share flat and 7% live with their parents/siblings.

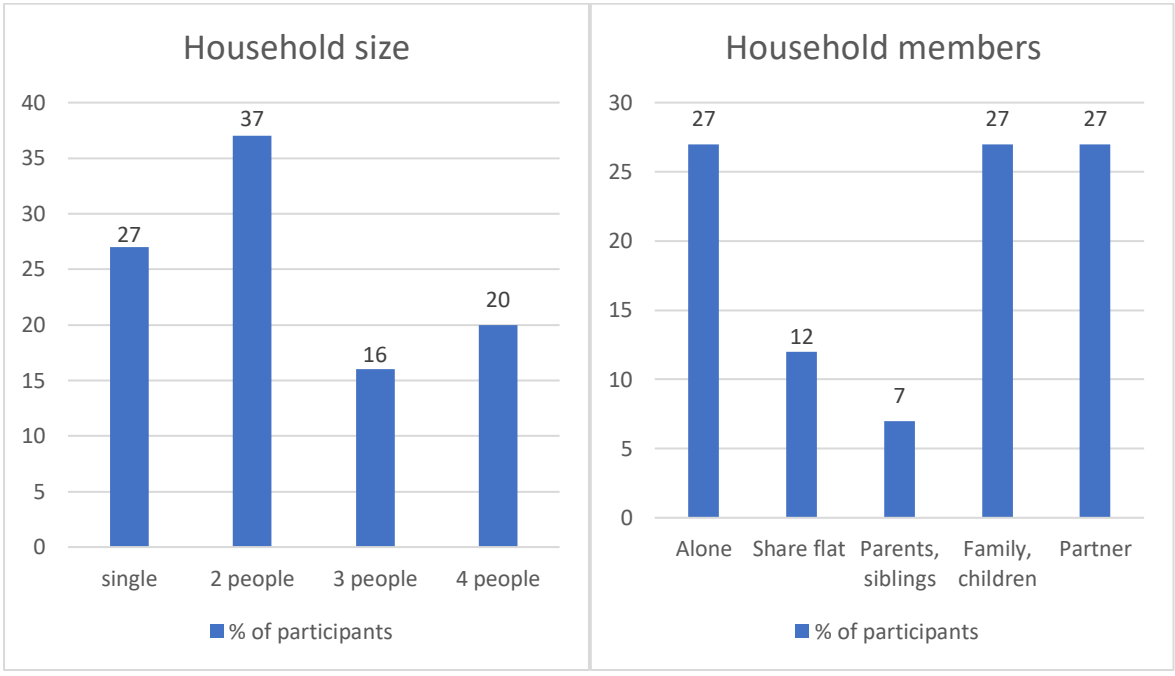

Figure 8: Household size and household members of meat consumers (n=30)

Source: Own representation

Figure 9 shows the net monthly income of the meat-eaters' group. 36% of people earn between €2000 and €3000 net per month. Followed by the next category between €1000 and €2000 net per month with 30% of interviewees. The salary of 17% of interview participants is higher than €3000 net per month. In the fourth place we have 10% of people with less than €500 net income and in the last place (7%) earn between €500 and €1000 net per month.

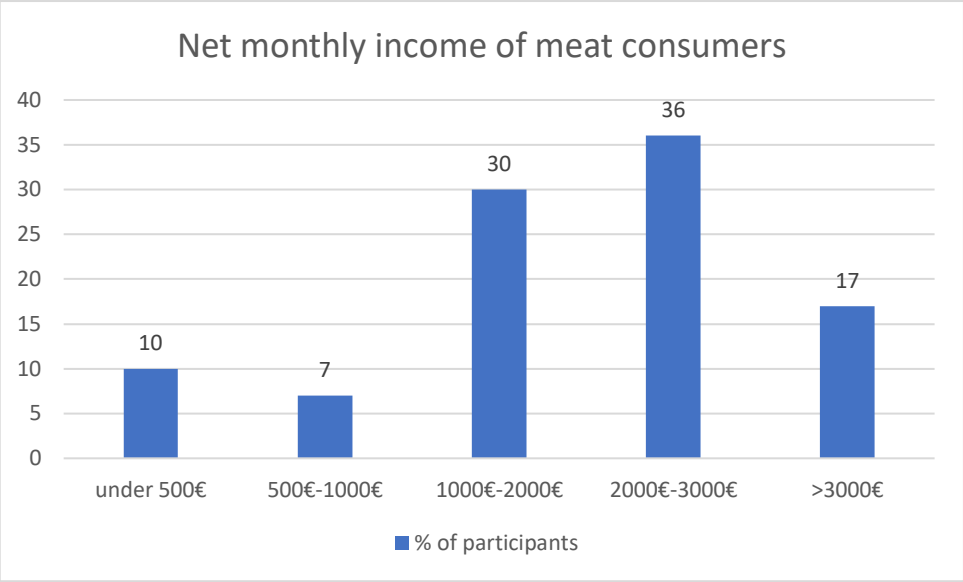

Figure 9: Net monthly income of meat consumers (n=30)

Source: Own representation

Table 8: Sample of meat consumers (n = 30)

Category	Number of participants	Percent of participants
Age		
18-25	4	13%
26-35	9	30%
36-45	8	27%
46-55	4	13%
56-65	5	17%
Gender		
Female	17	57%
Male	13	43%
Education		

University	17	57%
High School	11	37%
Compulsory school	1	3%
Completed apprenticeship	1	3%
Household size		
Single	8	27%
2 people	11	37%
3 people	5	16%
4 people	6	20%
Household members		
Alone	8	27%
Share flat	4	12%
Parents, siblings	2	7%
Family, children	8	27%
Partner	8	27%
Net monthly income		
Under €500	3	10%
€500-€1000	2	7%
€1000-€2000	9	30%
€2000-€3000	11	36%
>€3000	5	17%

Source: Own representation

7.1.2. Laddering interviews results

Figure 10 shows the Hierarchical Value Map (HVM) of meat consumer interviews. In total, nine attributes, ten consequences and six values were identified by analyzing the interviews. Some of the connections are not shown in the figure for the better overview.

"Taste" is the most frequently mentioned attribute. It leads directly to the "tastes good" consequence, which was named 18 times during the interviews. This consequence is linked to the most frequently named value "taste is important". Some people indicated that they have a "better mood" thanks to the good taste of meat. From these connections, we can see that taste plays an important role for the meat consumers. Some of the interviewees also mentioned that meat has a "nice texture", which they link to the good taste.

In the second place there is an attribute "good nutritional value", which is also specified through "iron rich" and "protein rich". "Good nutritional value" is connected to the frequently named consequence "healthy", which is linked to the important value "health and healthy lifestyle". As we can see from the ladder, meat consumers eat meat to stay healthy and to have a healthy lifestyle. They perceive meat as a very nutritional and healthy food option. "Good nutritional value" is also linked to the consequences "have more energy" and "feel full longer". Both of them are also linked to the consequence "be more productive", which is connected to another value "well-being (physical & emotional)".

Around one third of the meat consumers also believe that meat is a part of their "balanced diet". Balanced diet plays an important role for the "health and healthy lifestyle", as well as for the "well-being (physical & emotional)". People specified here that they feel emotionally better knowing that they are doing their best to stay healthy.

"Diversity" was also named frequently as a meat attribute. It refers, on the one hand, to consequence "healthy" and, on the other, to "more cooking possibilities". People who link diversity to health indicated that it is healthy to have different kinds of meat in order to get all needed nutrients from the food. The connection to the "more cooking possibilities" is linked to the value "convenience". Meat consumers explained that it was very convenient to have a lot of dish options and to have a possibility to decide what meal to cook based on the cooking time.

Next meat attribute "low in calories" was not mentioned as often. It is connected to the consequence "stay in shape", which is linked to the value "to look good". It is important to mention here, that the meat consumers specified poultry as a kind of low-calorie meat.

Last attribute refers to “always ate meat”, which is connected to the value “habit/traditions”. No consequences were mentioned to link the attribute to the value.

The ladders that are shown in the figure below are to be understood as hypotheses that can be researched further in a future quantitative study with a larger sample.

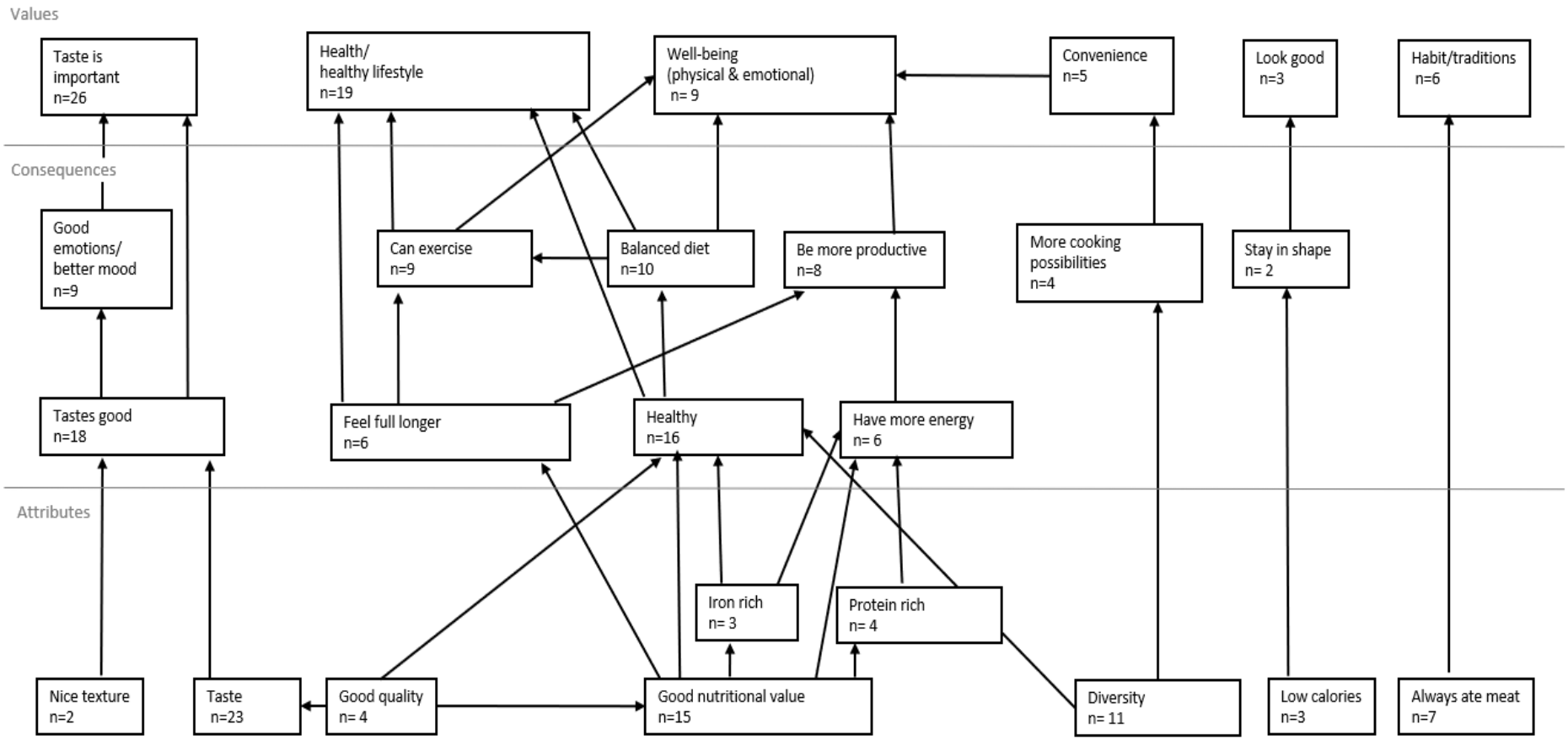

Figure 10: HMV meat consumers
Source: Own representation

7.1.3. Association test results

Meat consumers have mostly neutral (orange) and positive (green) associations with meat. However, a few negative (red) associations were also mentioned (see Figure 11). The associations were divided into four groups: "food industry and preparation", "health and healthy diet", "consumption and meal type", and "feelings".

Two biggest categories are "feelings" and "consumption and meal type". There are no negative mentions in the consumption and meal type category. People associate meat with different meat dishes. For example, steak and burgers were named eleven and seven times respectively. Positive mentions relate to good taste, smell and quality of meat.

Category "feelings" summarized different feelings people have or think of towards meat. Most of them are positive. A lot of people think of spending time with family and friends and feeling enjoyment and happiness. However, animal cruelty was mentioned quite a lot and falls under the negative associations.

The health category summarizes associations related to health and healthy diet. The majority of mentions here are positive. People associate meat with muscle gain, healthy lifestyle and iron/ protein source. On the other hand, there were two negative mentions of cholesterol and antibiotics in meat. Based on the associations from this category, we still can say that people primarily perceive meat as a healthy meal option.

Category "food industry and preparation" shows that people also associate meat with different places where they prefer to order meat meals, e.g., steak house and restaurants. This category also summarizes taste preferences, such as medium and smoked. One negative mention refers to industrial meat processing.

Legend for Figure 11:

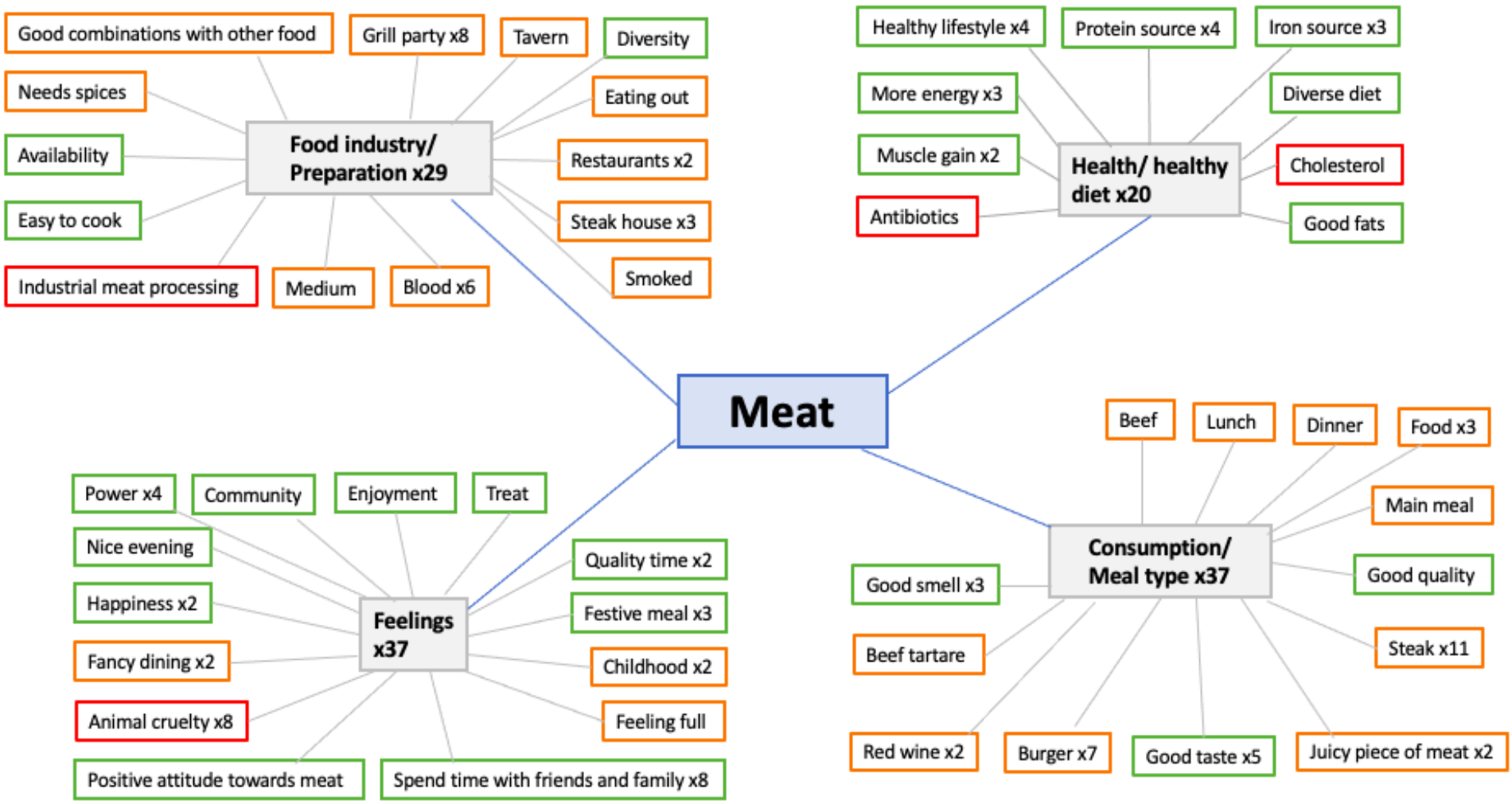

Figure 11: Association test of meat consumers

Source: Own representation

7.1.4. Analysis of additional questions

The first additional question refers to the frequency of meat consumption. The majority of interviewed people consume meat at least two times a week (57%). 33% consume meat once a week and 10% consume meat at least two times a month.

The next question was asked to identify any triggers that induced interview participants to consume meat. The results can be found in Figure 12 (all answers are presented in absolute frequencies). 74% of the meat-eaters group said that have always eaten meat and were raised this way. The rest (26%) had health-related triggers to why they consume meat: 13% have/had iron deficiencies, 10% did not consume enough protein from other protein sources and their doctors advised them to consume more meat or to start consuming meat. One person named fertility issues as a trigger to why they started to consume meat.

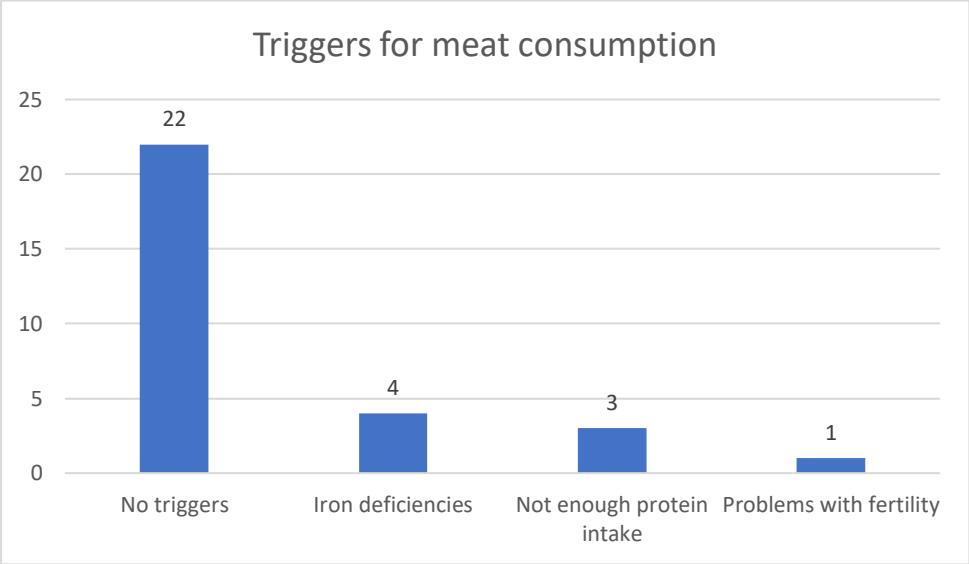

Figure 12: Triggers for meat consumption (n=30)

Source: Own representation

The second additional question refers to what types of meat are consumed. More than half of the participants (60%) eat all kinds of meat, 27% do not consume pork, and 13% consume only poultry.

The next question was asked in order to see what other animal products were also consumed by the participants. As expected, all participants also consume other animal products as can be seen in Figure 13 (all products mentioned are presented in absolute frequencies). Cheese and

dairy products were not put in the same category on purpose, as they were always mentioned separately and some people indicated that they eat cheese but no other dairy products.

Figure 13: Types of consumed animal products in meat consumers group

Source: Own representation

The majority of interviewed people buy meat in supermarkets. However, a few meat consumers mentioned that they try to buy organic meat in supermarkets. Additionally, organic-supermarkets were mentioned five times and markets were mentioned four times. One person answered "other" and indicated that a family member is a hunter and provides the majority of the meat for the family. The overview of the answers can be found in the Figure 14 (all answers mentioned are presented in absolute frequencies).

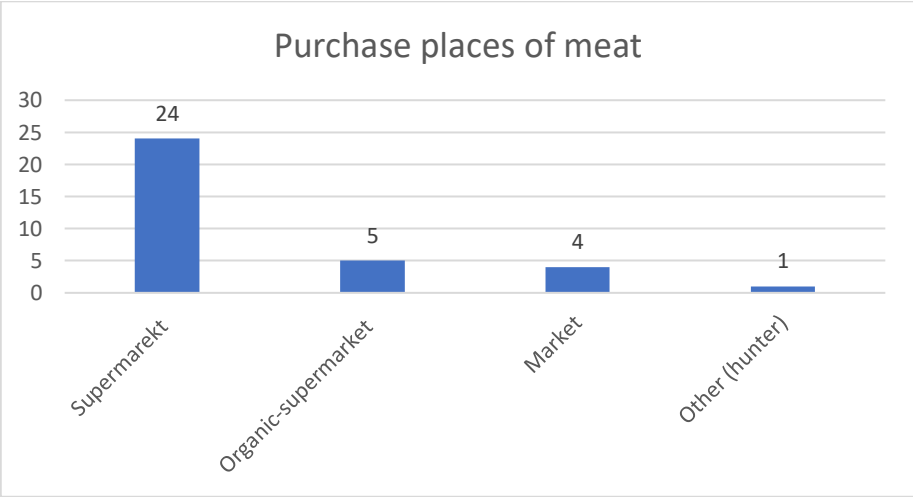

Figure 14: Purchase places of meat

Source: Own representation

The interviewed people who eat meat on a regular basis were asked if they also consume meat alternatives. Around 43% of the interview participants said that they do not consume any meat substitutes. 57% do include meat alternatives to their diet. Among these, the majority (41%) consume meat substitutes once a month, 29% eat meat alternatives at least two times a month. Less than once a month was an answer of 24% of people and only 6% consume meat alternatives at least two times a week.

Tofu is the most consumed meat alternative within the meat-eater group. In the second place with there are soya protein-based meat alternatives. In the third place there are seitan and Beyond Burger. Chickpea protein-based and pea protein-based foods are the least consumed meat substitutes. Figure 15 shows meat substitutes consumed by meat consumers group (all products mentioned are presented in absolute frequencies).

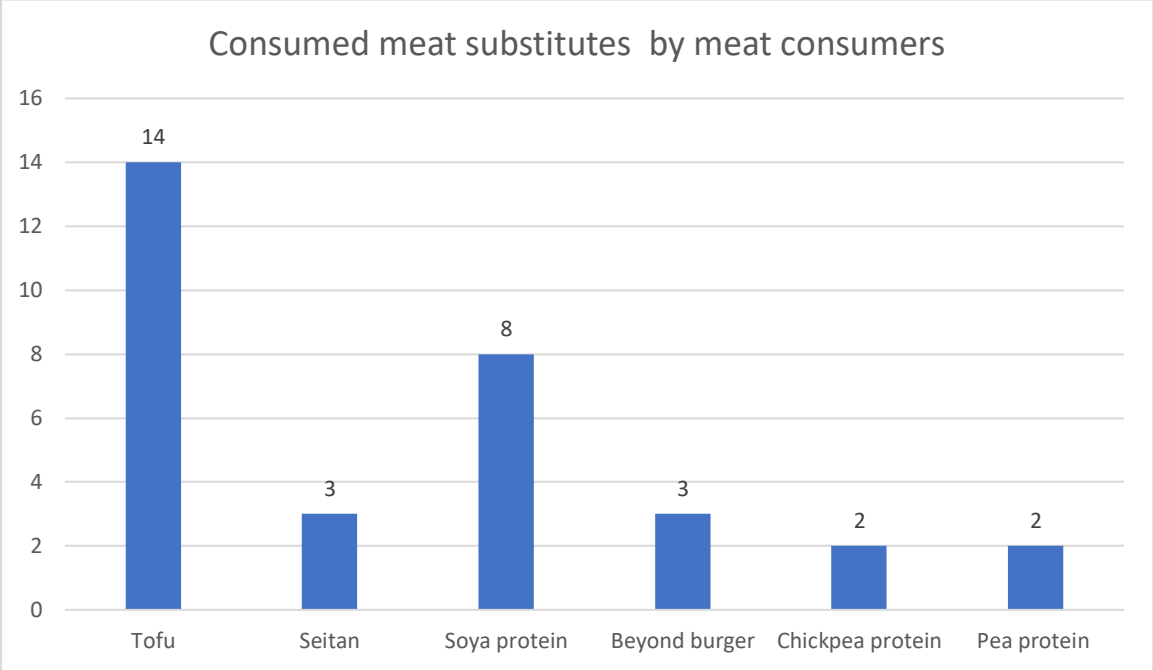

Figure 15: Consumed meat substitutes by meat consumers

Source: Own representation

Figure 16 shows the reasons why people additionally consume or do not consume meat alternatives (all reasons mentioned are presented in absolute frequencies). The green bars show reasons for the consumption and the red ones show reasons why meat consumers do not consume plant-based meat substitutes. Overall, the most popular reason for the consumption of meat substitutes is a greater diversity in the diet. In the second place, there is a wish to reduce

meat intake, followed by good taste. The following reasons were named not as often: “healthy option”, “out of curiosity”, “for the environment”, “a good alternative during fasting”. Fewer reasons were named as to why people do not consume meat alternatives. The most common reason is bad taste, followed by no interest. A few people also believe that meat substitutes are not healthy. Other reasons refer to too many additives and a high price.

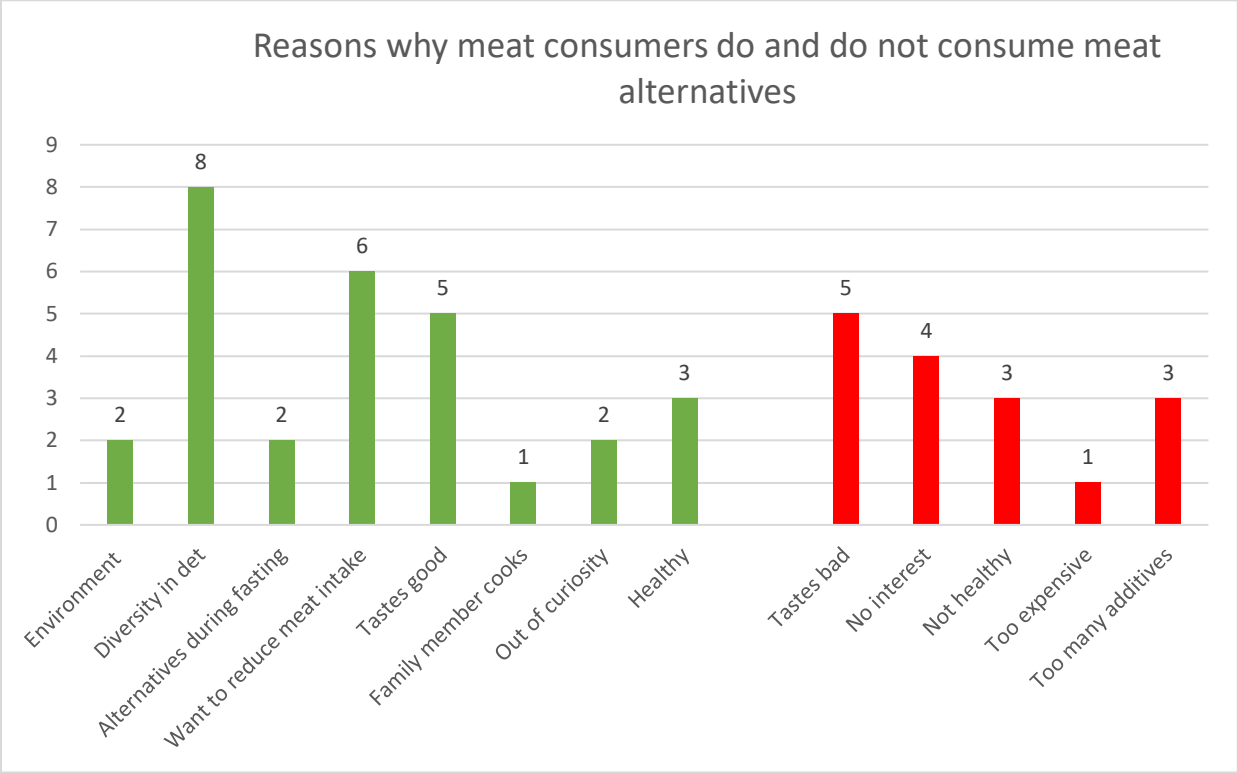

Figure 16: Reasons why meat consumers do and do not consume meat alternatives

Source: Own representation

The next question aimed to identify properties of meat alternatives that consumers would like to see in meat. Eight people said that there were no additional properties that they would wish for meat to have. However, the rest of the interviewed people named a few properties that they would like to have in meat. In the first place is no animal cruelty, followed by environmentally friendlier. In the third place, interviewees said that they wished meat would have been a bit healthier just as the meat alternatives. No additional hormones and antibiotics in meat were named three times and less fat was named twice. Figure 17 represents the results of the question (all answers mentioned are presented in absolute frequencies).

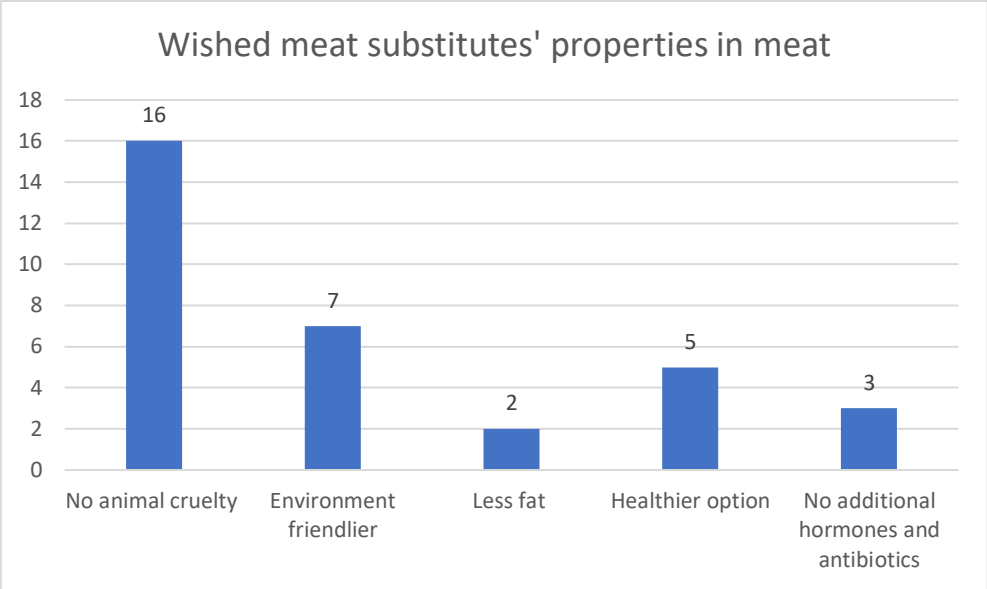

Figure 17: Wished meat substitutes' properties in meat

Source: Own representation

The majority of the interview participants said that family of friends were their primary source of information about meat. In the second place, there was own research conducted by participants to learn more about meat and its influence on human health. In the third place, doctors were mentioned as an information source. Social media were named three times. Advertisement and school were mentioned once. The overview of the answers can be found in Figure 18 (all answers mentioned are presented in absolute frequencies).

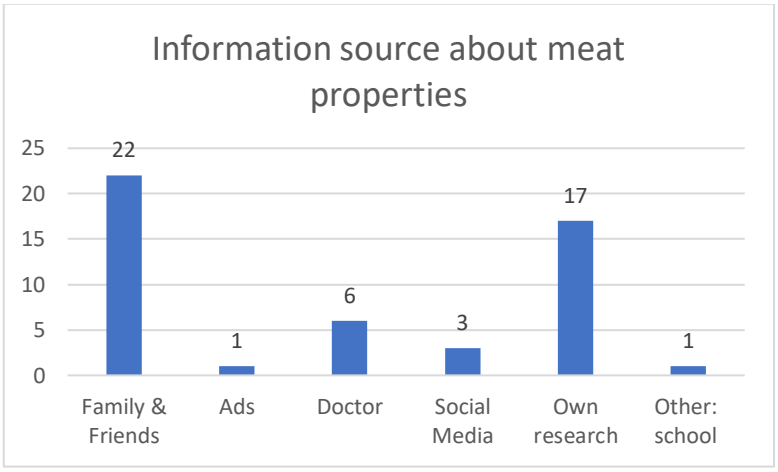

Figure 18: Information source about meat properties

Source: Own representation

The last set of questions consists of 4 scale questions to identify the influence of consumption of meat and meat substitutes on the physical and emotional well-being. Participants were asked to rate the questions on a scale from one (totally agree) to five (totally disagree) whether they think the consumption of meat and meat substitute would improve their physical health and if they feel emotionally better (have a better conscious) by consuming meat or meat substitutes. The average answers results are shown in Figure 19 und Table 9. As you can see, people tend to think that meat is a healthier option, however, the consumption of meat contributes less to emotional well-being compared to consumption of meat substitutes.

Table 9: Contribution to well-being - meat consumers (n = 30)

		Physical health	Emotional well-being
Meat consumers group	Meat consumption	2.5	3.8
	Meat substitute consumption	3.3	2.9

Source: Own representation

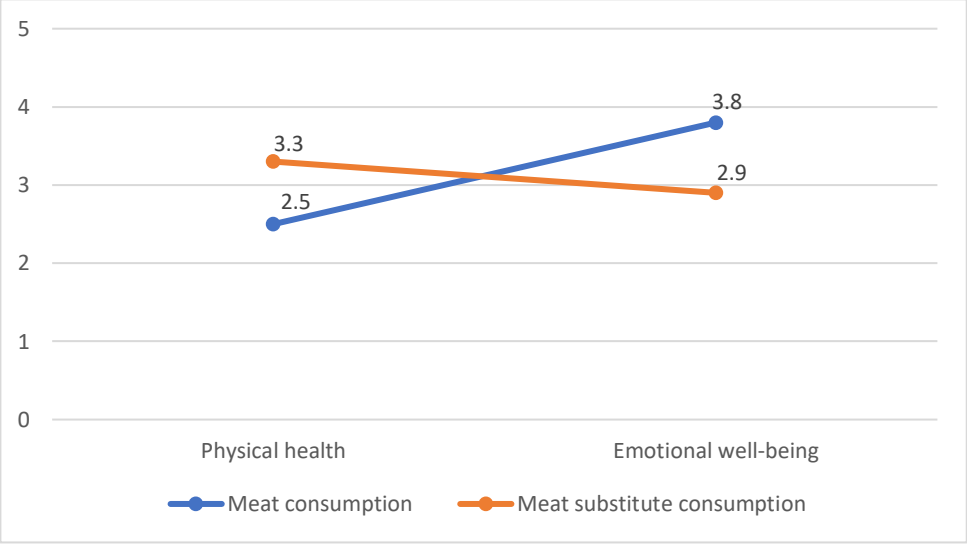

Figure 19: Contribution to well-being - meat consumers (n = 30)

Source: Own representation

7.2. Meat substitutes

7.2.1. Sample description

This chapter describes the sociodemographic data of the 30 interview partners who consume meat substitutes (an overview can be found in Table 10). Figure 20 shows the age and gender distribution within the group of participants who eat meat substitutes. In total, 77% of women participated in the interviews and 23% men. There is a big difference in category gender, however, it is not completely clear whether men just did not want to participate in the interviews or there are fewer men who consume meat substitutes compared to women in general. The latter would be a confirmation of the information found in the literature that more women have a vegetarian or vegan diet (Vegane Gesellschaft, 2014).

The age category between 26 and 35 years is the biggest group of interviewed people with 44%, followed by the category between 18 and 25 years (33%). In the third place, there are people at the age between 36 and 45 years old (13%). 6% of all interviewed people are between 56 and 65 years old and the smallest group is people between 46 and 55 years old with only 3%.

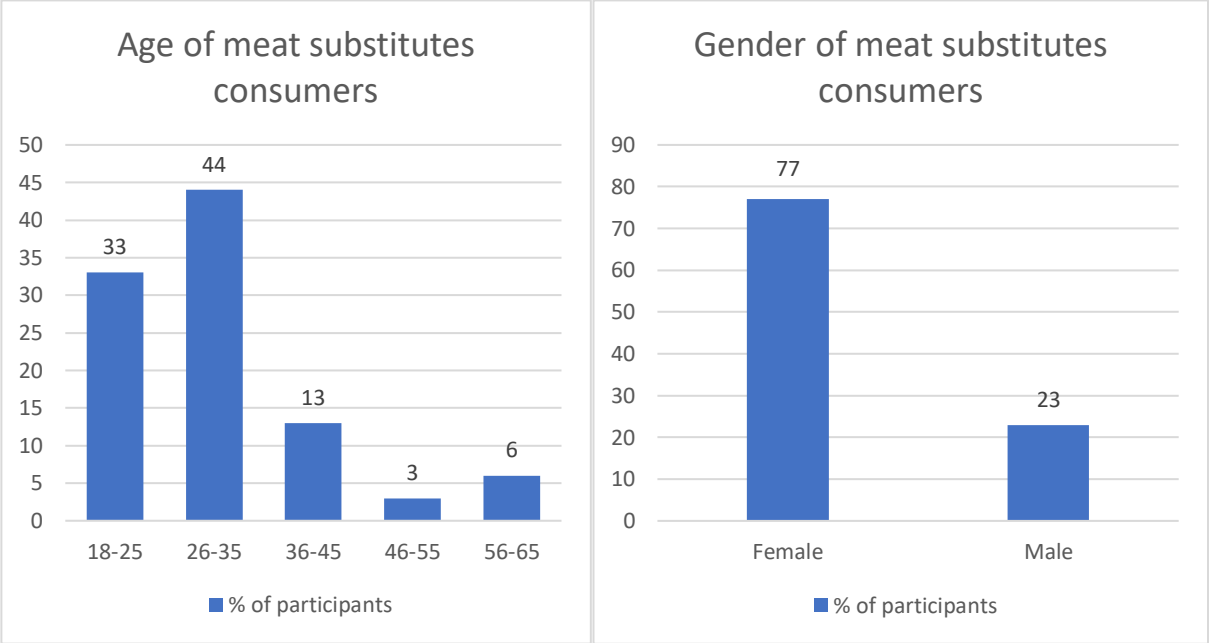

Figure 20: Age and gender of meat substitutes consumers (n=30)

Source: Own representation

The biggest group of meat substitute consumers, who participated in the interviews, is represented by people with a vegetarian diet (53%). Followed by flexitarians (30%) and in the last place, there are vegans with 17%.

The education level of people who consume meat alternatives is represented in Figure 21. Overall, the biggest part of participants has a university degree. This also confirms the information found in the literature that the biggest part of people with vegetarian or vegan diets has graduated from the university (Vegane Gesellschaft, 2014).

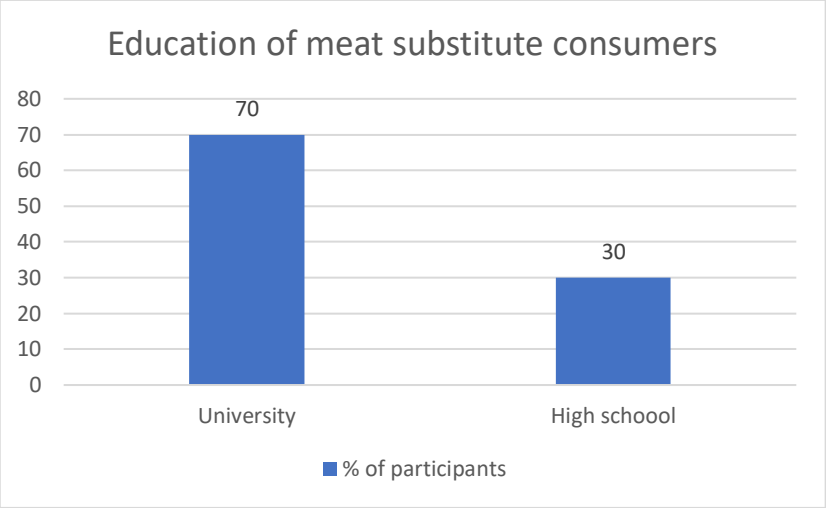

Figure 21: Education of meat substitute consumers (n=30)

Source: Own representation

Figure 22 shows the distribution of household size and household members of the interviewed people. 44% of all interviewees live in a two-people household, followed by singles and three-people household with 23% each category. In the third place (10%) of people with four people living in their home. The majority of surveyed people (40%) live with their partner. Followed by 23% of people who live alone. 17% live in a shared flat and 13% live with their families/children. In the last place, there are 7% of people who live with their parents/siblings.

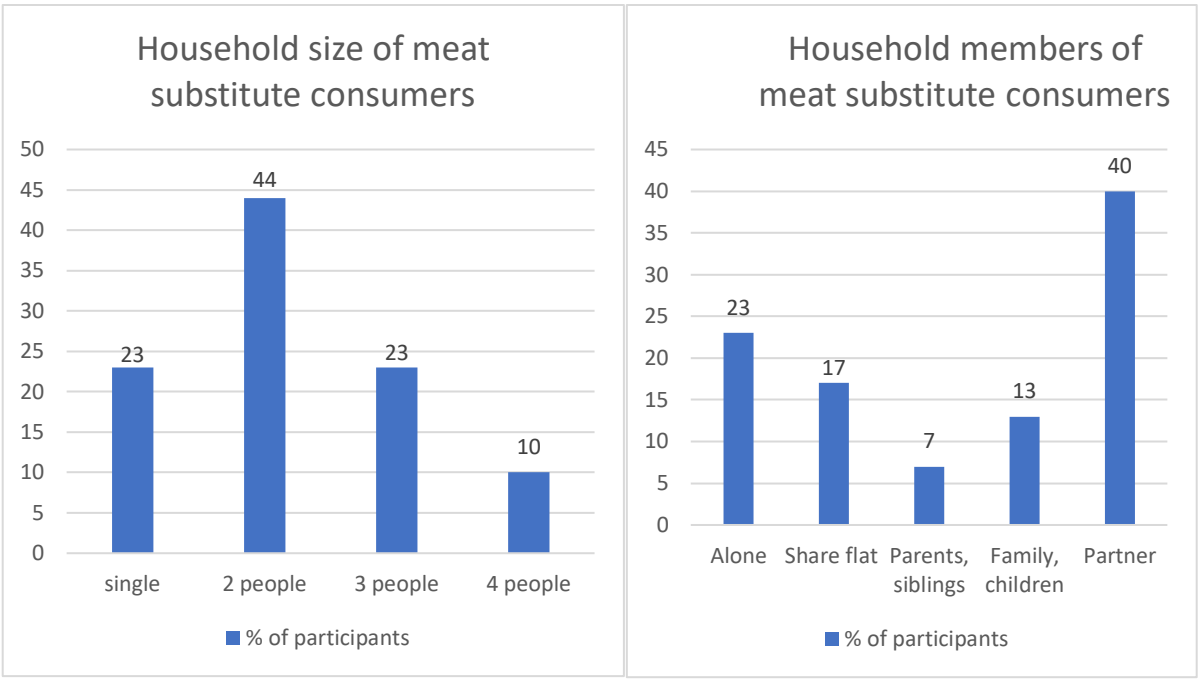

Figure 22: Household size and household members of meat substitute consumers (n=30)

Source: Own representation

The next Figure 23 shows the net monthly income. 30% of interviewed people earn between €1000 and €2000 net per month, also 30% earn between €2000 and €3000 net per month. The salary of 27% of interview participants is higher than between €500 and €1000 net per month. In the fourth place we have 10% of people with less than €500 net income and in the last place (3%) earn more than €3000 net per month.

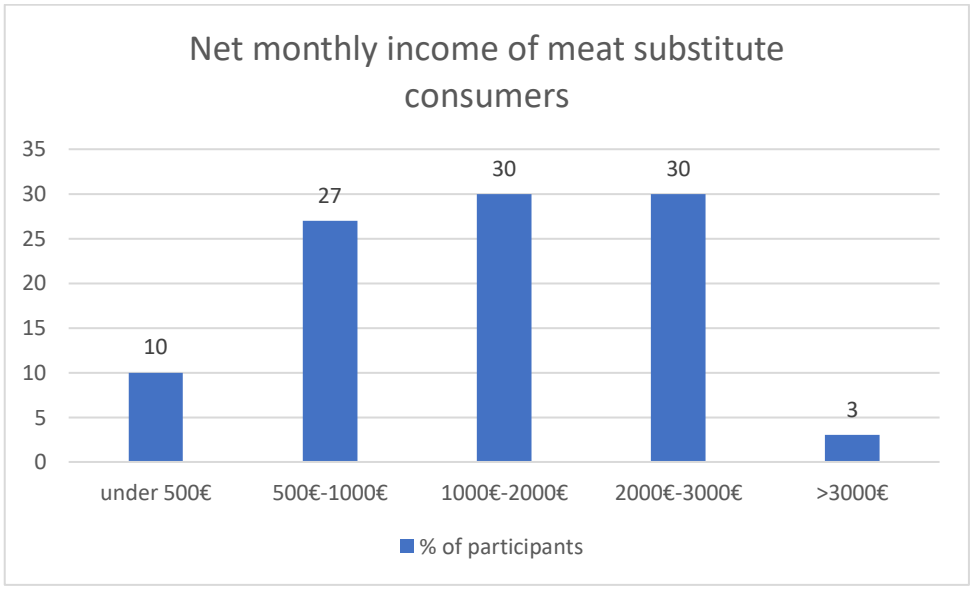

Figure 23: Net monthly income of meat substitute consumers (n=30)

Source: Own representation

Table 10: Sample of meat substitute consumers (n = 30)

Category	Number of participants	Percent of participants
Age		
18-25	10	33%
26-35	13	44%
36-45	4	13%
46-55	1	3%
56-65	2	7%
Gender		
Female	23	77%
Male	7	23%
Education		
University	21	70%
High School	9	30%
Household size		
Single	7	23%
2 people	13	44%
3 people	7	23%
4 people	3	10%
Household members		
Alone	7	23%
Share flat	5	17%
Parents, siblings	2	7%
Family, children	4	13%
Partner	12	40%
Net monthly income		
Under €500	3	10%
€500-€1000	8	27%
€1000-€2000	9	30%

€2000-€3000	9	30%
>€3000	1	3%
Diet		
Flexitarian	9	30%
Vegetarian	16	53%
Vegan	5	17%

Source: Own representation

7.2.1. Laddering interviews results

Figure 24 shows the Hierarchical Value Map (HVM) of meat substitute interviews. In total, ten attributes, fourteen consequences and eight values were identified by analyzing the interviews.

"Taste" is the most frequently mentioned attribute. It leads directly to the "tastes good" consequence, which was named 15 times during the interviews. This consequence is linked to the frequently named value "taste is important". From these connections, we can see that taste plays an important role for the meat substitute consumers. Every participant, who mentioned that taste is important for them, has always added during the interview that otherwise they would not eat any meat substitutes at all. Another connection from the attribute "taste" is to the consequence "satisfy cravings", which was named only three times. It connects to the value "treat myself". Meat substitute consumers mentioned that they perceive the products as something special and consume them only when they are really caring for some meat.

Another important property of meat substitutes is "animal friendly", which is directly linked to the most frequently mentioned value "ethics/ animal welfare". It was not surprising, that it is the most important value for the meat substitute consumers, as knowledge about suffering animals was the most frequently mentioned trigger for meat substitute consume (see chapter 7.2.3.).

"Good nutritional value" and "plant-based" are important attributes, which are connected to the second most important value "healthy lifestyle". People link both attributes to the "feeling better physically/less bloated" consequence. Some interviewees also mentioned that they "have more energy" and are "more productive". Overall, health and healthy lifestyle play an important role for meat substitute consumers.

The attribute "plant-based" is also connected to another attribute of meat substitutes "environmentally friendly", which then connects to the value "sustainability is important".

Sustainability was not mentioned as often as expected, however it can be simply explained by interview participants having no to little knowledge of the environmental consequences of meat production.

Attribute “diversity” is also important when talking about the meat substitutes. A few interview participants also mentioned that the development of meat substitute market is really exciting for them. The attribute leads to the “try something new/ diverse diet” value as well as to the value “convenience”. Property “diversity” is also linked to the value “health” trough the consequence “diverse nutritional elements & vitamins”. Here meat substitute consumer added that the choices on the market nowadays are so diverse that they get all macro- and micronutrients they need to stay healthy and sustain their healthy lifestyle.

The last value for meat consumes is “convenience” as mentioned above. As there are so many choices on the market right now, it is connected with the consequence “more cooking possibilities”. Another attribute “long shelf life“ is linked to the consequence “stay fresh longer” and therefore it is a convenient product to buy and store for a longer period of time.

The ladders that are shown in the figure below are to be understood as hypotheses that can be researched further in a future quantitative study with a larger sample.

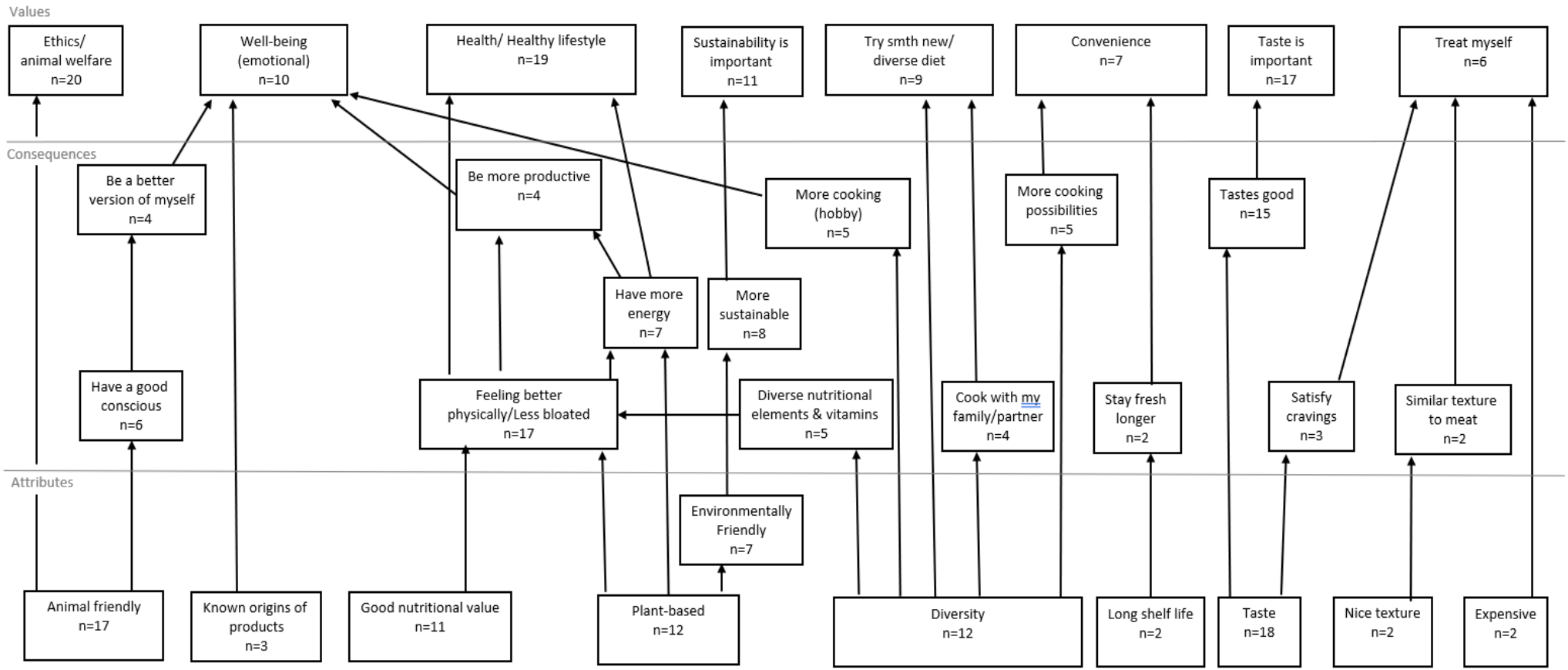

Figure 24: Hierarchical Value Map meat substitues (n=30)

Source: Own representation

7.2.2. Association test results

The majority of associations with meat substitutes that consumers have are positive (green). However, consumers also have negative (red) as well as neutral (orange) associations (see Figure 25). The associations were divided in five groups: "Environment", "Products and ingredients", "Feelings and taste", Image" and "Alternatives". Two associations were not placed into any existing categories: the association "discussions with friends" was named as a positive one and a neutral one, referring to hippies.

The biggest category refers to "Image" of meat substitutes. This category is quite diverse and represents the concepts that people link to meat substitutes. A few consumers names "innovative" and "future-oriented" as their first associations with meat substitutes. However, "expensive" was named

The category "Feelings and taste" summarizes consumer's feelings towards meat substitutes as well as the taste they associate with meat substitutes. The most named positive association is "no animal cruelty", which was named 10 times. However, there are two negative association such as "artificial" and "tastes weird".

Category "Products and ingredients" consists mostly of ingredients of meat substitutes as well as some meat substitutes – all marked as neutral. One negative association refers to too many additives in the meat substitutes to make them taste like meat. One positive association is "availability in fast food" – interview partner explained that meat substitute options are quite new to fast food chains and it is a big step for the whole industry to introduce this option to their menus.

Category "Environment" refers to positive impact on our planet in regard to environment that people associate with meat substitutes. On the other hand, "too much plastic in the packaging" were also mentioned.

Category "Alternatives" consists only of positive and neutral associations. "Healthier option" was the most common association that meat substitutes consumers had. A few people named "a lot of choices" as a positive association and compared the modern meat substitute market to a few years ago and pointed out that the changes are quite rapid.

Legend for Figure 25:

positive	neutral	negative

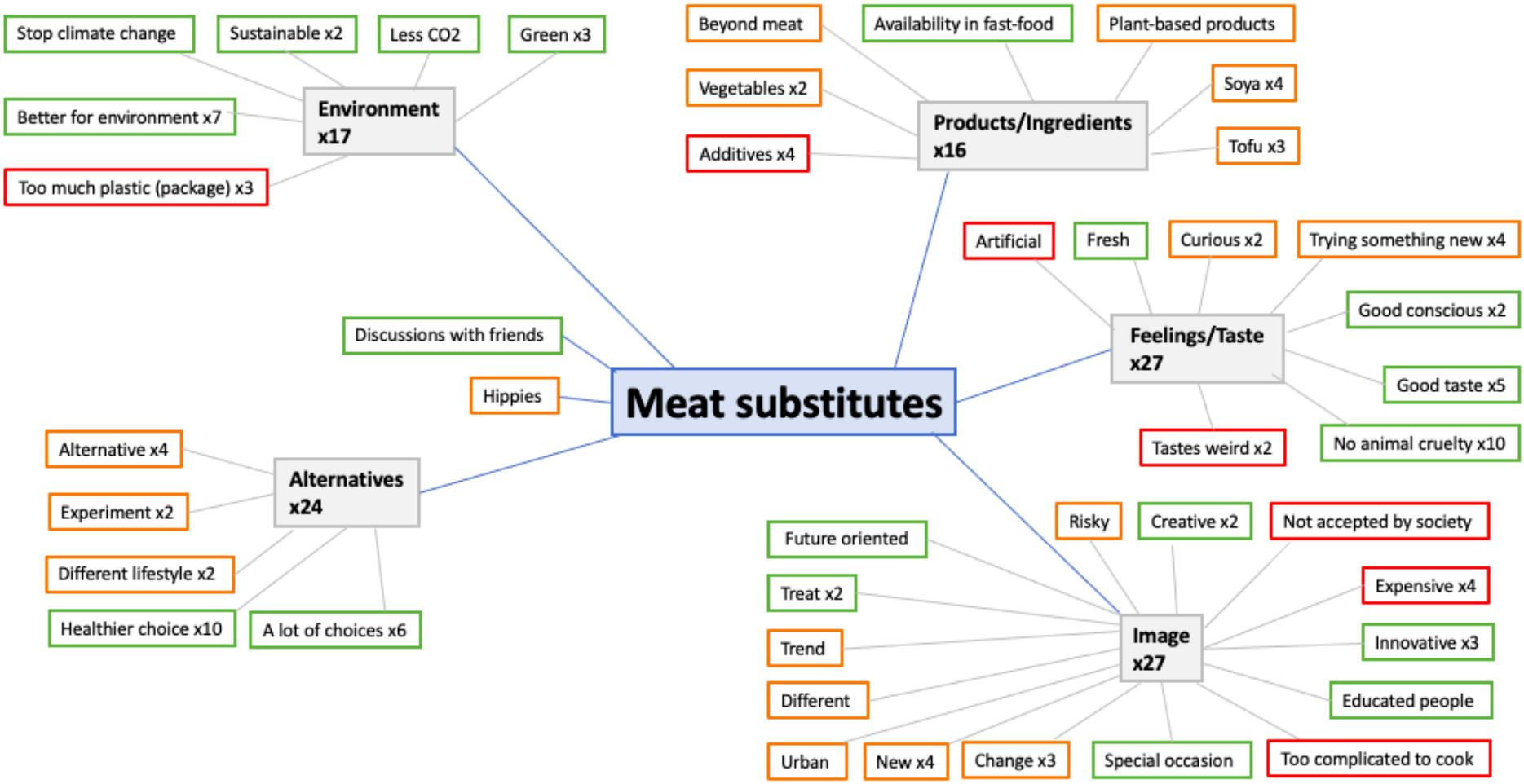

Figure 25: Association test of meat substitute consumers

Source: Own representation

7.2.3. Analysis of additional questions

The first of the additional questions refers to the frequency of meat substitute consumption. The majority of interviewed people consume meat substitutes once a week. 33 % consume meat substitutes at least two times a month and 24% consume meat at least two times a week.

The next question was asked to identify any triggers that induced interview participants to consume meat substitutes. Only 13% indicated that they did not have any triggers on why they eat meat substitutes. The overview of the triggers is shown in the Figure 26 (all triggers are presented in absolute frequencies). The main trigger is the knowledge of living conditions for animals for meat production. Another trigger was that interviewed people miss the taste of meat and also a family member does not eat meat was a popular answer to this question.

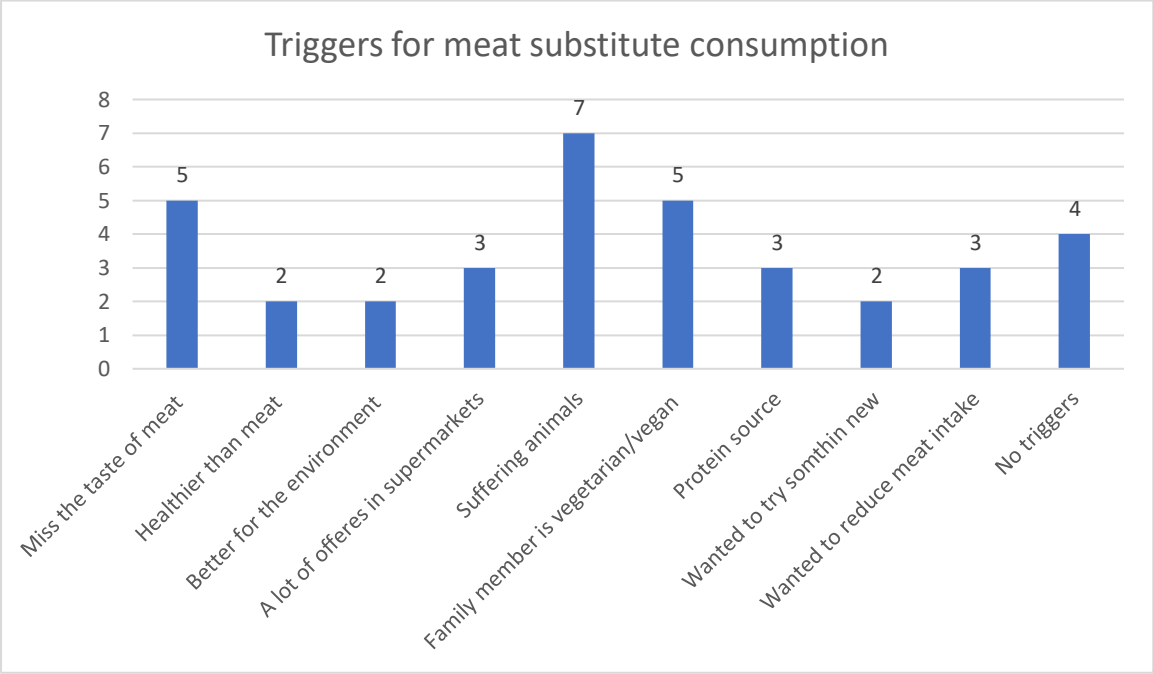

Figure 26: Triggers for meat substitute consumption

Source: Own representation

Another additional question refers to what types of meat alternatives are consumed. In the first place, there is tofu, followed by soy-based protein products. Seitan is also a quite popular meat substitute product. All answers can be found in the Figure 27 (all products are mentioned presented in absolute frequencies).

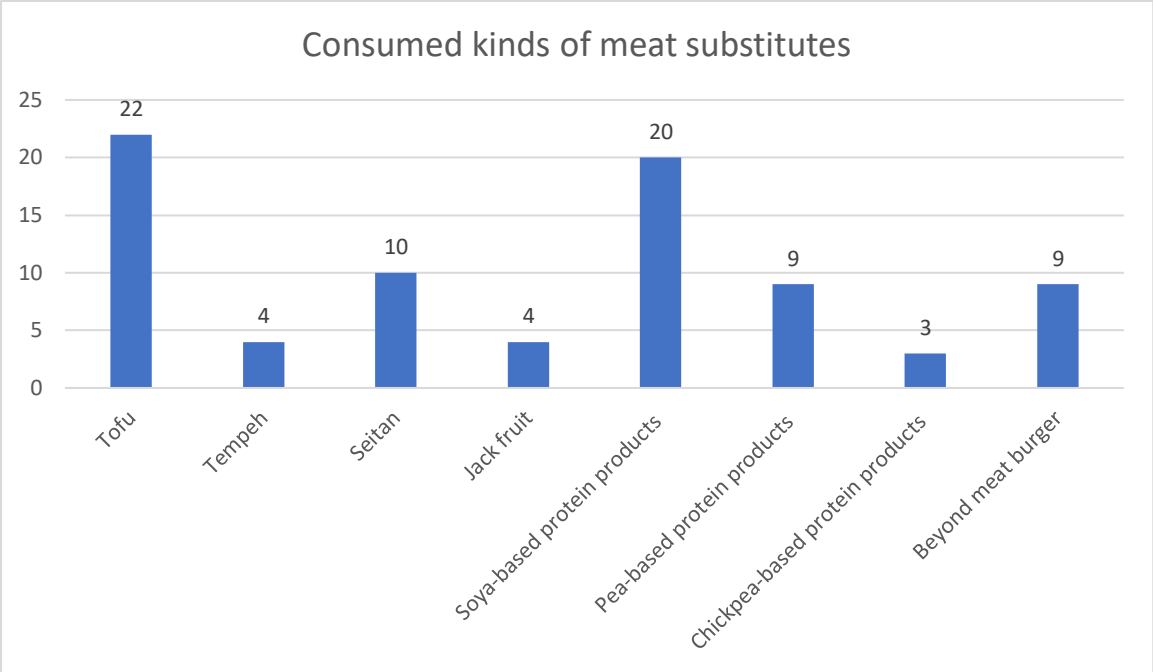

Figure 27: Consumed kinds of meat substitutes

Source: Own representation

The next question was asked in order to see what other plant-based products were also consumed by the participants. 33% of the interviewees (or ten people) said they do not consume any other plant-based alternatives. The rest answered that they also consume other plant-based alternatives as can be seen in Figure 28 (all products mentioned are presented in absolute frequencies). All vegans do, of course, consume plant-based dairy products. Some of the vegetarians and flexitarians consume only milk as a plant-based alternative. That is why milk and yogurt can be found on the graphic additionally to the dairy products.

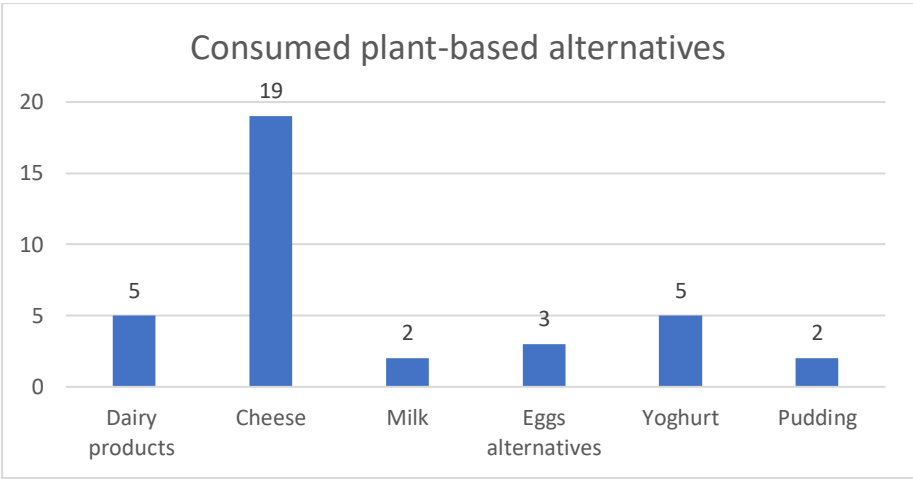

Figure 28: Types of additionally consumed plant-based alternatives

Source: Own representation

The majority of interviewed people buy meat substitutes in supermarkets. Additionally, organic-supermarkets were mentioned eight times and market war mentioned once as a place for buying tofu. The overview of the answers can be found in the Figure 29 (all answers mentioned are presented in absolute frequencies).

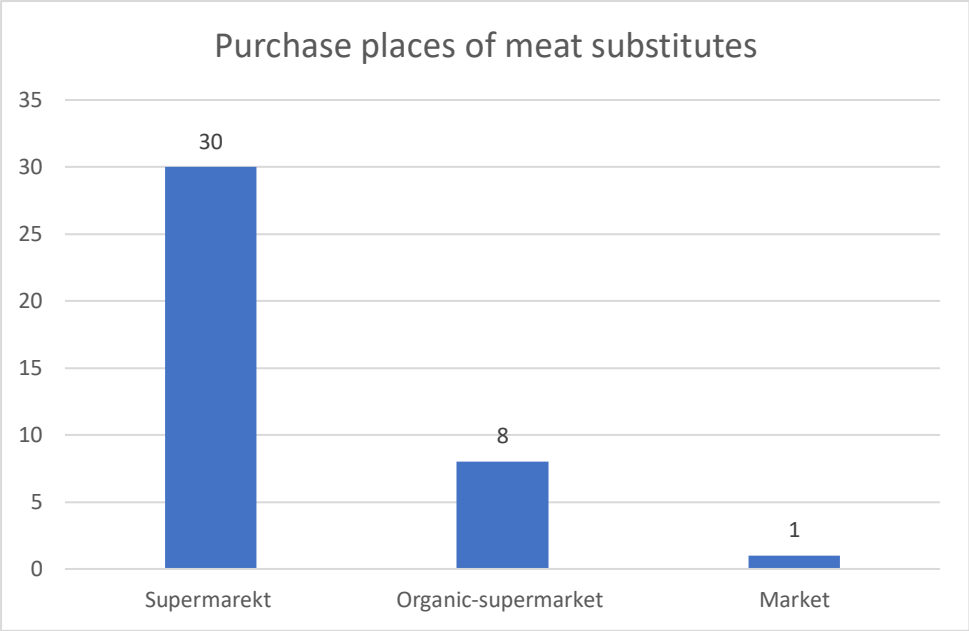

Figure 29: Purchase places of meat substitutes

Source: Own representation

The interviewed people who eat meat substitutes on a regular basis were asked if they also consume meat. The majority of interviewees (70%) said that they do not consume meat. The rest (30%) do additionally include meat to their diets. Among these, the majority (56%) consume meat at least two times a month. Two people (or 22%) eat meat at least two times a week. One person said that they add meat to their diet less than once a month and one people eat meat once a month.

Five people out of nine (or 56%) said that they consume all kinds of meat except for pork. Three people (or 33%) indicated that they consume all kinds of meat except for beef. They prefer not to eat beef as they percept this kind of meat as the most environmentally unfriendly. One person (or 11%) said that they consume only beef because of the iron deficiency.

The Figure 30 shows the reasons why people consume or do not consume meat (all reasons mentioned are presented in absolute frequencies). The green bars show reasons for the consume and the red ones show reasons why people do not consume meat. Overall, the most popular reason for the consumption of meat substitutes is meat taste. In the second place, people named

that they see meat as an opportunity to treat themselves. The following reasons were named not as often: not having enough time to prepare meals without meat, at family celebrations and out of habit. As expected, a lot more reasons were named as to why people do not consume meat. In the first place, people named the suffering animals linked to meat production. In the second place, that meat production has a negative impact on our environment. Also, quite a popular answer was that people do not think meat is healthy food.

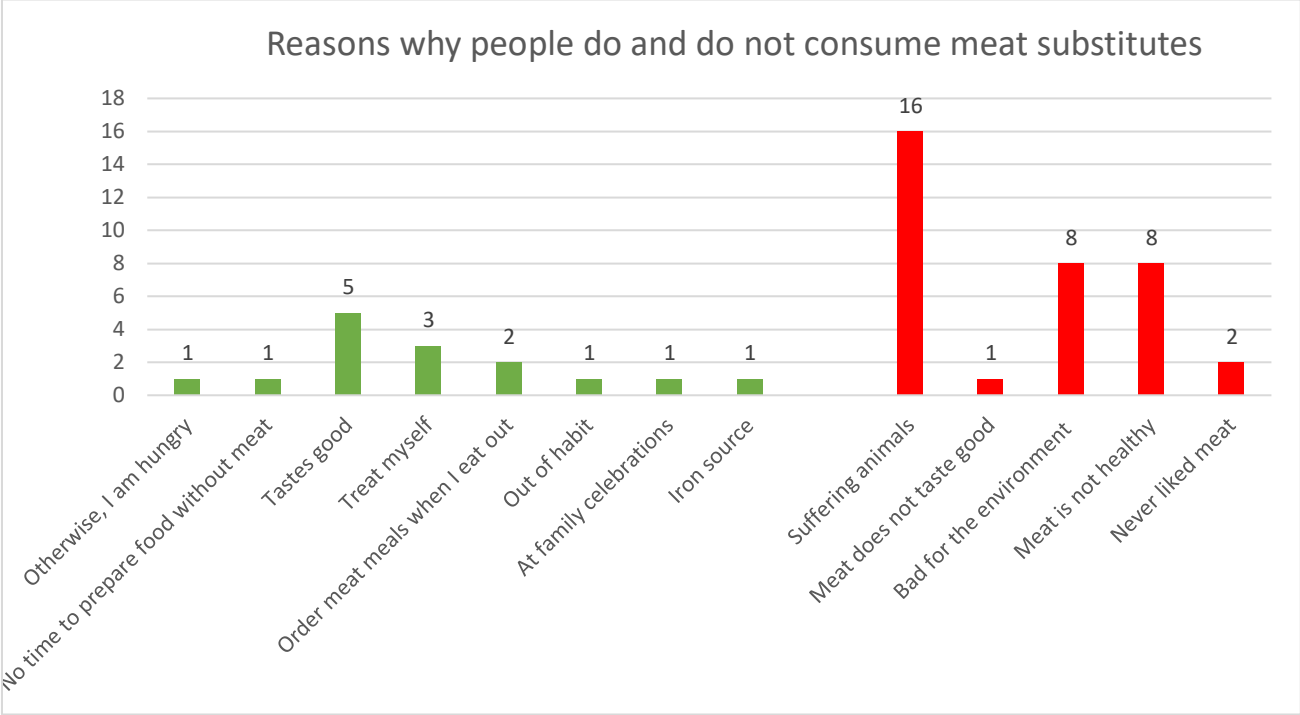

Figure 30: Reasons why people do and do not consume meat substitutes

Source: Own representation

The next question aimed to identify properties of meat that consumers would like to see in meat substitutes. Seven people said that there are no meat properties that they would wish for meat substitutes to have. However, the rest of the interviewed people named a few properties that they would like to have in meat substitutes. In the first place is, as expected, the taste of meat, followed by the texture of meat. Quite a few people mentioned that the meat substitutes industry has gotten way better in mimicking the taste of meat, however the texture of meat alternatives is still a bit off and is not comparable to the texture of meat. The Figure 31 represents the results of the question (all answers mentioned are presented in absolute frequencies).

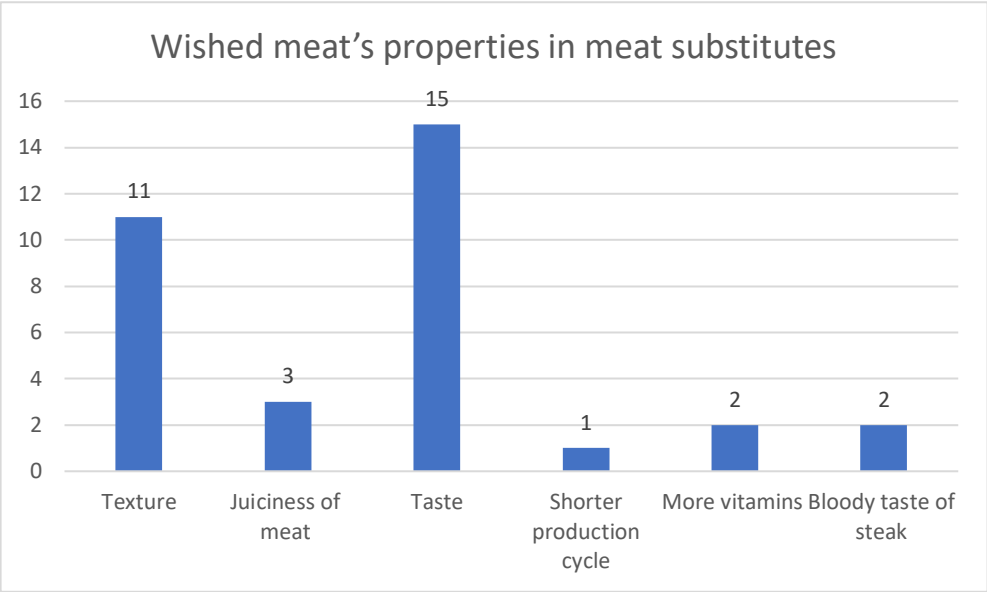

Figure 31: Wished meat's properties in meat substitutes

Source: Own representation

The majority of the interview participants said that their own research is their primary source of information about meat substitutes. In the second place, there are friends and family. In the third place, there is social media, which was mentioned eleven times. Doctor and advertisement were mentioned four times each (see Figure 32 - all answers mentioned are presented in absolute frequencies).

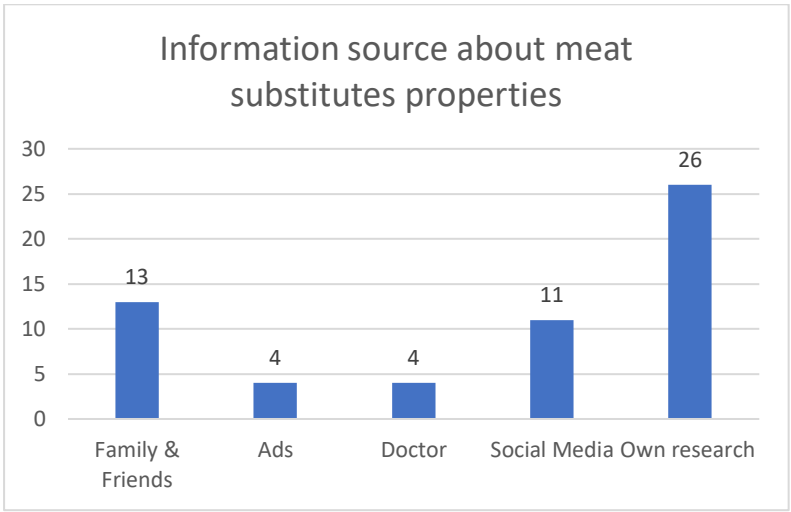

Figure 32: Information source about meat substitutes properties

Source: Own representation

The last set of questions consists of 4 scale questions to identify the influence of consumption of meat and meat substitutes on the physical and emotional well-being. Participants were asked to rate the questions on a scale from one (totally agree) to five (totally disagree) whether they think the consumption of meat and meat substitute would improve their physical health and if they feel emotionally better (have a better conscious) by consuming meat or meat substitutes. The average answers results are shown in Figure 33 and Table 11. As you can see from the graphic, people tend to think that meat substitute is a healthier option, as well as better for their emotional well-being.

Table 11: Contribution to well-being - meat substitute consumers (n = 30)

		Physical health	Emotional well-being
Meat substitutes consumer group	Meat consumption	4	4.6
	Meat substitute consumption	2.9	1.6

Source: Own representation

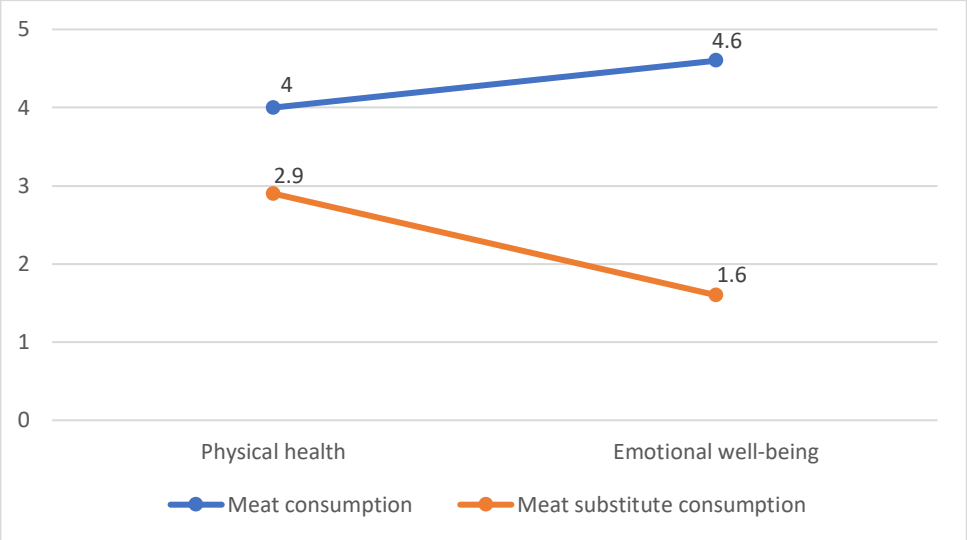

Figure 33: Contribution to well-being - meat substitute consumers (n = 30)

Source: Own representation

7.3. Comparison of results

7.3.1. Comparison of samples

Table 12 compares the socio-demographic data of meat and meat substitutes consumers.

Table 12: Sample of meat substitute and meat consumers (n = 60)

	Meat consumers	Meat substitutes consumers
Age		
18-25	13%	33%
26-35	30%	44%
36-45	27%	13%
45-56	13%	3%
56-65	17%	7%
Gender		
Male	43%	23%
Female	57%	77%
Education		
University	57%	70%
High school	37%	30%
Compulsory school	3%	0%
Completed apprenticeship	3%	0%
Size of the household		
Single	27%	23%
2 People	37%	44%
3 People	16%	23%
4 People	20%	10%
Household members		
Live alone	27%	23%
Parents, siblings	7%	7%
Partner	27%	40%
Share flat	12%	17%
Family, children	27%	13%
Income		

< €500	10%	10%
€500-€1000	7%	27%
€1000-€2000	30%	30%
€2000-€3000	36%	30%
>€3000	17%	3%
Diet		
Omnivorous	100%	0%
Flexitarian	0%	30%
Vegetarian	0%	53%
Vegan	0%	17%

Source: Own representation

As mentioned before and seen in the table, there is difference in the age category between the two interview groups. It was quite difficult to find people older than 45 years who consume meat substitutes. In total 30% of meat consumer group are older than 45 years old and only 10% of surveyed people who consume meat substitutes are older than 45 years. Also, the group between 18 and 25 years is by 20% bigger within meat substitute consumers.

Another difference between two groups can be seen in the gender distribution. The meat consumer group the gender distribution is more or less even in contrast to meat substitute consumers. There we have only 23% male participants.

Differences in income distribution between the two surveyed groups are also quite interesting. The group of people who earn from €500 up to €1000 net per month within the meat alternative group is 20% bigger than the same income group within the meat consumer interviewees. Also, 17% of meat consumers earn more than €3000 net per month compared to only 3% with the same salary level within the meat substitute group. However, this can be explained by the differences in the age categories as mentioned above. More younger people participated in the interviews related to consumption of meat alternatives.

7.3.2. Comparison of laddering results

There are some similarities as well as differences in the Hierarchical Value Maps (HVM) of both products. When comparing both HVMs, it is obvious that meat substitutes consumer named more attributes (10 vs. 9 in meat group), consequences (14 vs. 10 in meat group) and values (8 vs. 6 in meat group). However, the ladders of meat substitute consumers are shorter and not so many consequences are linked to each other. On the other hand, meat consumers

have connected quite a few consequences to each other before naming the value, which is why the ladders in the HVM of meat consumers are not as clearly shown as the meat substitute ones. One of the reasons for that could be that meat consumers have not thought why they consume meat in the first place and therefore did not provide clear and complete ladders.

Value "Taste" is very important for both consumer groups. For meat consumers it is the most important motive with 26 mentions compared to 17 mentions in meat substitute consumer group. Both ladders start with the attribute "taste". For meat consumers the consequence "tastes good" is often linked to "good emotions/better mood". Some of the meat substitute consumers also said that by eating meat alternatives that satisfy their "cravings" towards meat.

Interestingly, both groups of consumers rate the meat and meat substitutes in a similar way in terms of health. Motive "Health and healthy lifestyle" is very important one for both groups. Meat substitute consumers "feel better physically and less bloated" because meat alternatives are "plant-based" and have a "good nutritional value". Meat consumers also named "good nutritional value" of meat quite often, which is elaborated on through more meat properties, as "protein rich" and "iron rich". Both consumer groups indicated that they "have more energy" and therefore can be "more productive", which is linked to another major motive "well-being". Meat consumers have more complex ladders from "good nutritional value" to the motive "health and healthy lifestyle". Some said that they "feel full longer" and that is why they "can exercise", which is connected to both main motives "health" and "well-being". Another consequence from "good nutritional value" for meat consumers is just "healthy", which is linked to "balanced diet". Having a balanced diet for meat consumers means that is a part of their "healthy lifestyle" as well as it contributes to their "well-being".

Such attribute as "diversity" was also named by both consumer groups. The main motive from it refers to "convenience", as there are "more cooking possibilities". Both groups indicated the more diversity and choice they have the more convenient it is for them to cook. For meat consumers the aspect of convenience also contributes to their emotional "well-being". Both consumer groups link the property "diversity" to the motive "health". Meat consumers just said that it is "healthy", where meat substitute group specified that they get "diverse nutritional elements & vitamins". Meat substitutes consumers named more consequences. For example, thanks to the diverse choices of meat substitutes they can "cook with their families and partners", which leads to another motive "try something new/ have a diverse diet".

The most important motive for the meat substitute consumers is "ethics and animal welfare" which results from the attribute "animal friendly". However, some people consume meat

substitutes because they “have a good conscious”, which leads to their “well-being” as they are doing their best to “be a better version of themselves”.

Meat substitute consumers also said that it is “convenient” that meat substitutes have a “long shelf live” and therefore “stay fresh longer”.

Another motive for meat substitute consumer is “sustainability is important” and results from such product attributes as “plant-based” and “environmentally friendly”.

The last motive for meat substitute consumers is “treat myself”. Some consumers see meat alternatives as a treat because the products are quite “expensive”. Another say it is a treat because of “similar texture to meat”.

One separate ladder of meat consumers refers to the motive “habit and traditions”, which results from the attribute “always ate meat”. Meat consumers did not elaborate further upon this. Another motive is to “look good” and refers to the attribute “low in calories”, which is linked to the consequence “stay in shape”.

7.3.3. Comparison of association test

When comparing the results of both association tests, it is obvious that meat substitute consumers have a bigger variety of associations. Meat substitute consumers most often associate sustainability and perfect image with meat substitutes. The image of meat substitutes is especially linked to innovation, change and creativity. Meat substitutes consumers also think that meat substitutes are a healthier option. However, meat consumers named more associations linked to health and healthy lifestyle. Most of the association in this category are positive, like good fats, gain muscles and iron source. But there are also two negative ones: high level of cholesterol and antibiotics.

The rest of meat associations relate to “food preparation and food industry”, and “consumption and meal types”. Both meat and meat substitutes association tests contain category “feelings”. Meat consumers do have more positive associations within this category compared to meat substitutes.

Meat substitute group has also a category “alternatives”, which is not surprising and consists of such associations as different lifestyle and a lot of choices.

Both associations tests have positive, neutral and negative associations. However, meat substitutes consumer named more negative association compared to meat consumers.

7.3.4. Comparison of the additional questions

The majority of meat consumers did not have any triggers that induced them to consume meat, as they were raised in the families where no one questioned the meat intake and meat meals were a part of their day-to-day life. In contrast to the meat consumers, the meat substitutes consumers were able to name many different triggers for the consumption of meat substitutes. The main trigger relates to the knowledge about suffering animals and stock production. Quite a few participants named as the trigger that they just miss the taste of meat. Another popular trigger relates to the family member becoming a vegetarian or vegan, which induced the interview participants to change their diets to vegetarian or vegan as well.

Both groups buy the products mostly at the supermarkets. In the second place there are organic-markets for both groups. However, consumers of meat substitutes buy the meat alternatives more often at organic-supermarkets compared to meat consumers. Markets are in general not a popular option for purchasing meat or meat substitutes, but meat consumers go more often to markets to buy meat compared to meat substitutes consumers. This could be explained by markets not having various options compared to (organic-)supermarkets. One person from meat group indicated that they get their meat from a family member who is a hunter.

Around one quarter of interviewed people from both groups said that they do not wish any meat properties for meat substitutes and vice versa. The most popular answers from meat substitutes group are, as expected, the taste and texture of meat. The consumers of meat substitutes would like to have more “meat like” taste and texture, which is quite difficult to mimic as we learned from the theoretical part of the master thesis. The two most popular answers within the meat consumer group were that they wished from the meat substitutes that there were no harmed animals. This answer was also, as mentioned above, the most popular trigger for meat substitute consumption. In the second place people said they wished from the meat substitutes properties that meat was a little bit more environmentally friendly and in the third place there is a wish for meat to be a bit of healthier.

The consumers of the different product groups (meat and meat substitutes) receive information regarding the properties of meat or meat substitutes using different information sources (see Figure 34 - all answers mentioned are presented in absolute frequencies). Meat substitutes’ consumers have learned about properties, advantages and disadvantages trough their own research. In the second place, family and friends with vegan or vegetarian diets were their primary source of information. Social media was also quite popular answer within the meat substitute group. On the other hand, most of meat consumers said that they learned about meat

through family and friends. In the second place, they named their own research and the third popular answer was doctor, as a few of the interview participants stated health problems as a trigger for meat consumption.

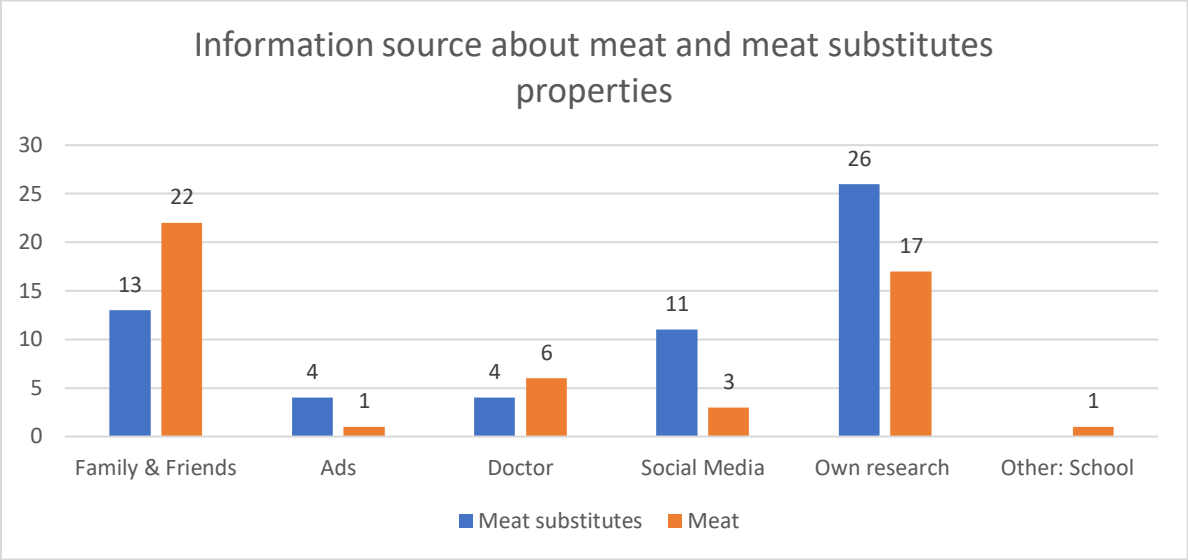

Figure 34: Information source about meat and meat substitutes properties

Source: Own representation

More than half of meat consumers (57%) also consume occasionally meat substitutes. In comparison, only 30% of meat substitutes consumer also eat occasionally meat. Interestingly, the majority of participants from the meat substitutes consumer group consume meat more often (at least two times a month) compared to the meat eaters who consume meat substitutes.

The most important reason for the meat consumption in the meat substitute group is the taste of meat. Some people see meat as a treat and treat themselves with meat meals and others get meals with meat when they go out to eat/order food. Meat eaters' group, on the other hand, consume meat substitutes mostly because they wish for more diversity in their diet or they try to reduce their meat intake.

The most important reason for the meat substitutes group for cutting meat out of their diet was the knowledge about suffering animals and the impact of meat production on the environment. One of the popular reasons was also the assumption that meat is not a healthy meal. It is important to add here that most vegetarians and vegans said they do not want to consume any kinds of meat even if there were no meat substitutes option, they would not eat meat. Meat consumers do not consume meat substitutes mainly because of its taste and have no interest to

try them. Also, some assume meat substitutes are not as healthy as meat and have too many additives to mimic the taste of meat.

Both interview groups had to estimate the contribution of meat and meat substitutes to their physical health and emotional well-being. Both groups anticipated that they feel emotionally better if they consume meat substitutes, compared to meat consumption. Meat substitutes consumer gave a worse grade to meat consumption for the emotional well-being. As expected, the meat substitute consumers gave a better grade to the meat substitution in regard to their physical health. On the contrary, the meat eaters think meat contributes more to their physical health compared to the meat substitutes. The mean values of the contributions are shown in Table 13 and Figure 35.

Table 13: Comparison of contributions to well-being (n=60)

		Physical health	Emotional well-being
Meat substitutes consumer group	Meat consumption	4	4.6
	Meat substitute consumption	2.9	1.6
Meat consumer group	Meat consumption	2.5	3.8
	Meat substitute consumption	3.3	2.9

Source: Own representation

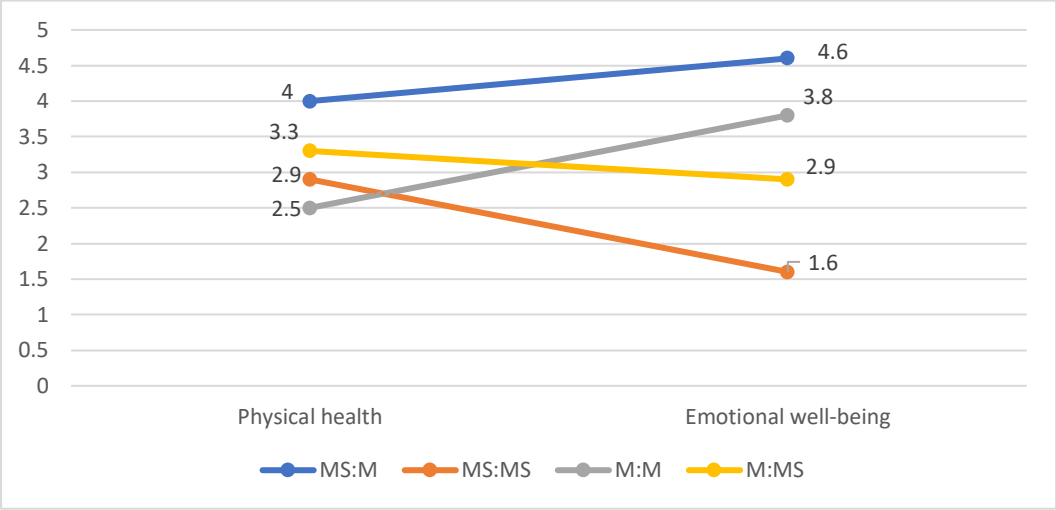

Figure 35: Comparison of contributions to well-being (n=60)

Source: Own representation

8. Discussion

8.1. Discussion of methods

The goal of the empirical part of this research was to identify motives and values of meat and meat substitutes consumers and to compare the results. A qualitative research method – Laddering interviews and Means-End Chain Analysis – was used and described in Chapter 5. The direct elicitation technique was used during the interviews in order to exclude any influence from the interviewer side and to get a diverse selection of attributes. In accordance with the chosen method, the products' attributes, consequences and values were identified and Hierarchical Value Maps were created for both consumer groups. Further, association tests and additional questions about consumer behavior were asked.

Almost all interviews were conducted via Skype or WhatsApp (with video) due to pandemic and social distancing rules. Only a few interviews were held face-to-face. It was important to ensure that the interview partners were comfortable enough to talk about their values and their consumer behavior. Both consumer groups were very motivated to talk about the topic and their experience and attitudes.

Interestingly, on average, interviews with meat consumers were longer compared to those with meat substitutes consumers. The reason for that is that the consumers of meat substitutes are more aware of their motives and they usually knew exactly, why they consume meat substitutes. On the other hand, meat consumers, who have always eaten meat and did not have any medical conditions that induced their meat consumption, have never thought about the reasons behind their meat consumption.

One of the challenges was the clear presentation of the ladders. The program "LadderUX" was used to show the ladders and links between attributes, consequences and values that were identified during the interviews. However, the connections were not clear and transparent enough. The HVMs were created in PowerPoint. Another challenge was, as expected, the missing elements of the ladders. Some interviewees named product attributes and linked them directly to their values and left out the consequences. Sometimes additional questions helped to identify the consequences, but it was not always the case.

8.2. Discussion of results

The motives for consuming meat and meat substitutes were assessed by using the method of means-end chain analysis using the laddering technique. Further, the results of association tests and the additional questions provide more information in regard to the consumer motives.

Motives for meat substitute consumption

The aim of the master's thesis was to have equal age distribution within the meat substitute consumers group. However, almost half of the participants were between the age 26 and 35 years. Only 9% were older than 45 years. This corresponds with the results from Marktmeinungmensch (2020), which states that the biggest group of vegetarians are people between age 16 and 29. Since, meat substitutes are vegetarian/ vegan products, we can assume that the biggest consumer group are younger people. The equal gender distribution was not achieved as well – 77% of the interviewees were women. However, this result is also in line with the Marktmeinungmensch (2020) results, that says that 75% of people with vegetarian or vegan diets are women.

The main motives for meat substitute consumption for people in Vienna (Austria) are ethics and animal welfare, health and healthy lifestyle and taste. Other important motives refer to sustainability, well-being, having a diverse diet and convenient lifestyle (in terms of having a bigger choice of cooking possibilities). Meat substitute consumer also perceive meat alternatives as treat.

The main motive "ethics and animal welfare" was named 20 times by the meat substitute consumer group. Suffering animals and knowledge about bad conditions in livestock production was also the main reason why people started to consume meat substitutes in the first place. The association "no suffering animals" was named 10 times in regard to meat alternatives. In the study by Circus and Robinson (2018) the "moral and ethical reasons" was also a number one reason for the consumption of plant-based meat alternatives. Other studies also listed animal welfare as one of the drivers for meat alternative consumption (Schlösler et al, 2014; Elzermann et al, 2013; Weinrich, 2018). Animal welfare was also the most popular answer to the question within the meat consumer group: "What kind of properties do meat alternatives have that you wish meat had?".

Another important reason for the consumption of meat substitutes is "health and healthy lifestyle". Health-related topics were also one of the named triggers for meat substitutes

consumption. People perceive meat alternatives as a healthier option compared to meat (based on the association test in Chapter 7.2.2.). These findings are consistent with the results of other studies. Weinrich (2018) listed health in the top three reasons for meat substitute consumption. Health and nutrition reasons were ranked number two in the study by Circus and Robinson (2018). Elzermann et al (2013) also name health as one of the reasons for the consumption of meat substitutes. Interestingly, some meat consumers also perceive meat substitutes as a healthier option and named it as one of the desired meat substitute's properties. Health was also one of the reasons why some meat consumers occasionally consume meat substitutes.

The next significant motive for meat substitute consumers is "taste". This motive is not listed in any studies mentioned above. However, this is one of the most important motives for the meat substitute consumptions identified in this research. Meat substitute consumer specified that they would not consume the products at all, if they did not like the taste. Some of the consumers also enjoy the taste of such alternative as tofu, which does not have any taste resemblances to meat. However, some interviewees stated that they miss the taste of meat, which was one of the triggers to start consuming meat alternatives. Meat consumers who occasionally eat meat substitutes also said that the good taste of the products is one of the reasons why they consume them.

Meat substitute consumers try to minimize their negative impact on the environment by replacing meat. Therefore, the aspect of "sustainability" is also highly relevant. Meat substitute consumers perceive the products as environmentally friendly, which is shown in the association test. Environment is also one of the triggers for meat substitute consumption. It is also the case in the studies by Weinrich (2018), Circus and Robinson (2018) and Hoek et al (2011). The increasing awareness highlights the importance people attach to sustainable lifestyle, which influences our eating and consumption habits (Rützler and Reiter, 2020).

Meat substitute consumers appreciate the diversity of available products on the market, which leads to the motive "try something new/ diverse diet". Having a lot of choices nowadays is important to meat substitute consumers, which for some was also a trigger why they started to consume the meat alternatives. Meat substitute consumers enjoy having a bigger choice in the restaurants compared to a few years before. A high number of products allows to discover new cooking possibilities for meat substitute consumers. A study by Hoek et al (2004) confirms the positive attitude of meat substitute consumers towards discovering new ways of cooking.

The motive of "well-being" plays an important role for meat substitute consumers. They feel better emotionally, as they have a better conscious, knowing that the products are animal

friendly and plant based. Meat substitute consumers also indicated that they can be more productive thanks to having more energy, which contributes to their emotional well-being. This finding is also confirmed in the study by Ruby (2012).

Also, diversity of meat substitutes products means "convenience" for some consumers. Long shelf life of meat alternatives refers to the motive "convenience" as well. However, it is also one of the reasons why meat consumers do not eat meat substitutes: there are too many additives. Some meat substitute consumers also associate meat alternatives with having too many additives.

The motive "treat myself" (indulgence) is not specified in any studies mentioned before. Some meat substitute consumers miss the taste of texture of meat and they perceive meat substitutes as a way to treat themselves. A few of consumers mentioned "treat" and "special occasion" in the association test.

Since meat substitute products are vegetarian or vegan, the motives for the meat substitute consumption are very similar to the motives for a vegetarian or vegan diet. Animal welfare, health and environment are the top three motives for choosing vegan or vegetarian lifestyle (Janssen et al, 2016; Dyett et al, 2013; Fox & Ward, 2008; Waldmann et al, 2003).

The main motive for flexitarians that were questioned for this master thesis is "ethics/ animal welfare". The second reason for meat substitute consumption for flexitarians is "try something new/ diverse diet" and on the third place is "sustainability". No significant difference in frequency of the meat substitute consumption was identified compared to vegans or vegetarians.

However, due to the small sample size, no statistical tests can be applied, to see if differences in motives based on different diets are significant.

Interestingly, despite "taste" and "health" being one of the main motives for meat substitute consumers, meat consumers stated that "bad taste" and "not healthy" as two top reasons for not wanting to include meat substitutes to their diet.

Motives for meat consumption

Motives for meat consumption are similar to the motives for meat substitute consumption. The main motives for meat consumption for people in Vienna (Austria) are taste and health and healthy lifestyle. Other motives refer to physical and emotional well-being, convenient lifestyle, habits and traditions. Looking good in terms of appearance and staying in shape is also a motive for some meat consumers. Compared to meat substitute consumer, animal welfare,

sustainability and the desire for more diverse diet, as well as the wish to try something new were not mentioned as motives by meat consumers to eat meat. Overall, people had more positive associations with meat and have connected meat to a lot of positive feelings, such as happiness and enjoyment.

The main motive for meat consumption is "taste". Some consumers indicated that they are in a better mood and feel emotionally better when they eat a tasty meal, which almost always contains meat. Meat consumers also often associate meat with good taste. The taste is also the most popular reason why flexitarians occasionally consume meat. It is also the most wished meat property that meat substitute consumers would like to have in meat alternative products. Other studies confirm that taste is the major motivator for people to continue meat consumption and, therefore, the biggest barrier for limiting their meat consumption (Beardsworth and Bryman, 2004; Bogueva et al, 2017, Mullee et al, 2017).

The next major motive for meat consumption is "health and healthy lifestyle". Due to the fact that meat is a good source of protein and iron, people indicate that meat is a part of the balanced diet and overall just a healthy meal. There were not many triggers named for the meat consumption. However, assumed iron deficiencies and not sufficient protein intake were one of the most important triggers for meat consumption. Meat consumers appreciate the fact that the feeling of saturation stays longer and that they have enough energy to exercise, which is also a part of a healthy lifestyle. After analysing the association test, it is obvious that most people perceive meat as a healthy option. These finding are confirmed in other studies. Mullee et al (2017) lists health among other motives for meat consumption. In a study by Bogueva et al (2017) health was the most important motive.

Most of meat consumers ate meat their whole life and continue eating meat as a "habit/traditions". 74% of interviewed meat consumers said that they were raised this way and meat was always a part of their diet. Some meat consumers also associate meat with their childhood and festive meals, e.g. Christmas family celebrations. Mullee et al (2017) also found that habit was one of the most frequently named reasons for meat consumption among flexitarians and omnivores. Study conducted by Lea and Worsley (2002) shows that not being willing to change their habits was one of the top reasons why meat consumers were not willing to change their diet to a vegetarian one.

Meat consumers just as meat substitute consumers enjoy the diversity of meat options and cooking possibilities. Meat consumers know the recipes that they enjoy and they appreciate the "convenience". Some meat consumers indicated that they would save time cooking meat vs.

cooking a vegetarian meal. Meat consumers perceive vegetarian recipes as more time-consuming and complicated (Lea and Worsley, 2002). Another aspect of convenience refers to a bigger choice on the menu in restaurants.

Another major reason for meat consumption is contribution to "well-being". Both physical and emotional well-being of meat consumer is important to them. As mentioned above, people feel full longer, as well as have more energy, and, therefore, can be more productive in their everyday life, which contributes to their emotional well-being. Doing sports also contributes to both physical and emotional well-being of meat consumers. Bogueva et al (2017) study support the findings, that meat contributes to the emotional and physical well-being of meat consumers.

"Look good" is also one of the named reasons for meat consumption, as meat (especially poultry) is low in calories and perceived as dietary food. Lea and Worsley (2002) and Bogueva (2017) also indicated in their studies that meat consumers connect meat to their weight-loss goals.

9. Conclusion

This master's thesis addresses the motives and values behind the consumption of meat and meat substitutes. The theoretical part includes detailed description of meat substitute products and ingredients, as well as health and environmental benefits that meat substitutes can offer compared to meat. Austrian and global markets for meat and meat substitutes are also described in this part. Since meat substitutes products are either vegetarian or vegan, motives for vegan and vegetarian diets are also explained. The empirical part includes assessment of the interviews using the method of means-end analysis, as well as the results of association tests and additional questions.

Two main motives for meat consumptions are also valid for the meat substitute consumption: taste and health. Both consumer groups perceive the products as healthy and as a part of the healthy lifestyle. Taste plays a bigger role for meat consumers; however, meat substitute consumers also care about the good taste of the products and would not otherwise consume them. Well-being is also a major motive for both consumer groups. Meat substitute consumers mostly refer to the emotional well-being, as the products are plant-based and animal-friendly. Meat consumers refer to their well-being in both ways: physical and mental. This results from the fact that meat has good nutritional value and is a part of the healthy balanced diet. Meat consumers also indicated that they have more energy and can do sports, which also contributes to their physical and mental well-being.

The biggest difference between the motives for meat and meat substitute consumption is that animal welfare as well as sustainability play a central role for meat substitute consumers. Animal welfare is also the main reason why people started to eat meat substitutes. This motive was the most frequently named during the interviews. Since meat substitute products are plant-based, they are perceived as animal and environment friendly. Meat substitute consumers consider meat substitutes more resource-saving compared to meat production.

Meat substitute consumers also eat the products in order to try something new and to have a more diverse diet. Besides animal welfare, this motive was one of the main reasons for meat substitute consumption for flexitarians.

Meat consumers, who indicated that they have always eaten meat and were raised this way, appreciate the traditions in connection to the meat meals. For example, some consumers associate festive Christmas dinners and childhood memories with meat. Meat consumers often

continue eating meat just because meat has always been part of their diet, which is not applicable to meat substitute consumers.

The findings of this research are in line with already conducted studies and also provide new insights on the matter. According to Sondergaard (2005), the results of MEC method can be used for product development and new marketing strategies. In fact, we cannot continue to consume meat at the current rate we do it now. With the rise of a wealthy middle class in China alone, the additional demand for meat will increase the need for soy bean and corn, a significant part at the expense of tropical rainforests. In a developed country as Austria, consumers do have a lot of power and can contribute to changes in the food market. People should change their purchase behavior in the first place, as it is the only way to change meat production and to influence policymakers. There are many ways what can contribute to the changes in the meat sector. For example, reducing meat intake, buying only good quality regional meat and trying new meat alternatives.

From a marketing point of view, the emphasis of organic meat should be on animal welfare as it is a very prominent topic nowadays and could contribute to changing purchase habits toward more sustainable meat. For meat substitutes, the focus should be on the similarity of meat substitute taste to the real meat taste in order to convince more meat eaters to try a more sustainable version.

The identified motives of this thesis deliver a solid basis for a future quantitative Austrian-wide study, to see how many Austria consumers share the motives and values for meat and meat substitute consumption.

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Annex

Annex I: Questionnaires meat and meat substitutes

Questionnaire meat substitutes

1. Do you buy/consume meat substitutes?

   □ yes □ no

2. How often do you consume meat substitutes?

   □ 1x month
   □ min. 2x month
   □ 1x week
   □ min. 2x week

3. Were there any triggers (causes) that induced you to consume meat substitutes? If yes, which?

□yes □ no

.....

4. What kind of meat substitutes do you consume?

.....
.....
.....

5. Do you consume other plant-based food alternatives? If yes, what kind?

□ no
□ yes

.....
.....
.....

6. Where do you buy meat substitutes?

   □ Supermarket
   □ Bio market

□ Market (e.g. Naschmarkt)
□ Other: .....

7. Do you also consume meat or meat products?

□ yes □ no

a. **if yes,** what kind of meat and products?

.....
.....
.....

b. **if yes,** how often?

□ Less than once/month
□ Once/month
□ Min 2x/month
□ Min. 2/week

c. **if yes,** why? What are the reasons?

.....
.....
.....

d. **if no,** why don't you consume meat and meat products?

.....
.....
.....

8. What kind of properties does meat have that you wish plant-based meat alternatives had?

.....
.....
.....

9. What do you associate with meat substitutes or what comes to mind when you think of meat substitutes? What words, pictures, situations? (Association test)

.....
.....
.....

10. Laddering: When you think of meat substitutes, what are the properties that motivate you to consume it?

.....
.....
.....
.....

a. What properties or reasons are most important to you personally? Please rank your answers.

b. Why the first characteristic is the most important one to you?

.....
.....
.....

c. *(Why is this important to you?)*

11. Who or what informed you about the properties / benefits of meat substitutes?

□ Family/Friends
□ Advertisement
□ Doctor
□ Social Media
□ Own research
□ Other:...

12. Please answer the next 4 questions on a scale from 1 to 5 (1-strongly agree, 5 strongly disagree)

a. Eating plant-based meat alternatives will improve my physical health? ___
b. I feel emotionally better when I eat plant-based meat alternatives? ___
c. Eating meat will improve my physical health? ___
d. I feel emotionally better when I eat meat? ___

13. How would you describe your diet?

□ Omnivorous (you both plant-based and animal-based food)
□ Flexitarian (most of the time you consume plant-based products bur occasionally eat meat and fish)
□ Vegetarian (you do not consume meat and seafood products)
□ Vegan (you do not consume any animal-based products)
□ Other .....

- Age
  _____

- Gender

□ male □ female

- Education

□ Compulsory school
□ Completed apprenticeship
□ Matura
□ University/college
□ Other: …….

- Size of your household

□ Single household
□ 2 People
□ 3 People
□ 4 People
□ More than 4 people

- Household members

□ Family - children
□ Partner
□ Parents, siblings
□ Share flat with roommates
□ Live alone

- Monthly income

□ under 500 €
□ 500 – 1000 €
□ 1000 – 2000 €
□ 2000 – 3000 €
□ more than 3000 €

Questionnaire meat

1. Do you buy/consume meat?

   □ yes □ no

2. How often do you consume meat?

   □ 1x month
   □ min. 2x month
   □ 1x week
   □ min. 2x week

3. Were there any triggers (causes) that induced you to consume meat? If yes, which?

□yes □ no

.....

4. What kind of meat do you consume?

.....
.....
.....

5. Do you consume other animal products? If yes, what kind?

□ no
□ yes

.....
.....
.....

6. Where do you buy meat?

   □ Supermarket
   □ Bio market
   □ Market (e.g. Naschmarkt)
   □ Other: .....

7. Do you also consume plant-based meat alternatives (tofu, veggie patties, vegan/vegetarian options for meat)?

   □ yes □ no

   a. **if yes,** what kind of meat alternative products?

.....
.....
.....

   b. **if yes,** how often?

□ Less than once/month
□ Once/month
□ Min 2x/month
□ Min. 2/week

   c. **if yes,** why? What are the reasons?

.....
.....
.....

   d. **if no,** why don't you consume meat alternatives?

.....
.....
.....

8. What kind of properties do meat alternatives have that you wish meat had?

.....
.....
.....

9. What do you associate with meat or what comes to mind when you think of meat? What words, pictures, situations? (Association test)

.....
.....
.....

10. Laddering: When you think of meat, what are the properties that motivate you to consume it?

.....
.....
.....
.....

a. What properties or reasons are most important to you personally? Please rank your answers.

b. Why the first characteristic is the most important one to you?

.....
.....
.....

c. (Why is this important to you?)

11. Who or what informed you about the properties / benefits of meat?

□ Family/Friends
□ Advertisement
□ Doctor
□ Social Media
□ Own research
□ Other: .....

12. Please answer the next 4 questions on a scale from 1 to 5 (1-strongly agree, 5 strongly disagree)

a. Eating plant-based meat alternatives will improve my physical health? ___
b. I feel emotionally better when I eat plant-based meat alternatives? ___
c. Eating meat will improve my physical health? ___
d. I feel emotionally better when I eat meat? ___

13. How would you describe your diet?

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□ Flexitarian (most of the time you consume plant-based products bur occasionally eat meat and fish)
□ Vegetarian (you do not consume meat and seafood products)
□ Vegan (you do not consume any animal-based products)
□ Other .....

- Age

  _____

- Gender

□ male □ female

- Education

□ Compulsory school
□ Completed apprenticeship
□ Matura
□ University/college
□ Other: …….

- Size of your household

□ Single household
□ 2 People
□ 3 People
□ 4 People
□ More than 4 people

- Household members

□ Family - children
□ Partner
□ Parents, siblings
□ Share flat with roommates
□ Live alone

- Monthly income

□ under 500 €
□ 500 – 1000 €
□ 1000 – 2000 €
□ 2000 – 3000 €
□ more than 3000 €

Annex II: Implication matrix meat and meat substitutes

IMPLICATION MATRIX MEAT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
taste								1|0				18|0						3|6				3|19			
diversity													4|0	1|0						0|2	0|1		0|2		
good nutritional value					1|0	2|0		1|0		3|0	0|3			4|1	2|1	0|4	5|0			0|4	0|11				
nice texture																		1|0							
iron rich										2|0				1|1							1|3				
protein rich														1|0		3|0	1|1				1|5				
low in calories																			2|0						1|2
good quality														1|1				0|1			0|2	0|1			
always ate meat																								6|0	
have more energy											4|0			1|0		1|0				0|5	2|1				
be more productive															2|0					4|0					
tastes good																		6|0				12|6			
more cooking possibilities																				1|1			4|0		
healthy																1|1	2|0			0|1	9|2				
feel full longer																1|0	1|0				2|1				
can exercise																	2|0			3|0	6|0				
balanced diet																				3|1	3|2				
good emotions/better mood																						8|0			
stay in form																									2|0
well-being (mental physical)																							1|0		
health/healthy lifestyle																									
taste is important																									
convenience																									
habit/traditions																									
good appearance																									

IMPLICATION MATRIX MEAT SUBSTITUTES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
taste													13|0								2|0						2|13					0|2
diversity														3|0				2|0	0|4	1|0				5|0		0|2		0|3			1|1	
good nutritional value											0|1								5|0							5|5						
nice texture																							2|0									0|1
animal friendly															5|0	0|4									1|2				11|0			
plant-based							2|0				3|2	0|3					0|2		5|0						0|2	0|5				2|2		
env. friendly																		6|0													1|5		
expensive																																2|0
known origins of products																									2|0							
long shelf life																						2|0						0|2				
have more energy												2|0							3|0						0|1	5|0						
be more productive																			2|1						3|0							
tastes good																											15|0						
more cooking possibilities																												5|0					
have a good conscious																4|0									0|2							
be a better version of myself																									2|0							
more sustainable																														7|0		
cook with my family/ partner																															1|0	
feeling better physically/ less bloated																								4|0	0|2	9|2						
more cooking (hobby)																									2|0							
satisfy cravings																																2|0
stay fresh longer																												2|0				
similar texture to meat																																1|0
diverse nutritional elements & vitamins																										0|2						
well-being (mental physical)																																
health/healthy lifestyle																																
taste is important																																
convenience																																
ethics/ animal welfare																																
sustainability is important																																
try smth new/ diverse diet																																
treat myself																																