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Italian consumer behaviour towards plant-based meat

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Introduction

In recent years, the food sector and consumers' behaviour towards food has changed significantly due to sustainability. The Global Risks Report 2020 classifies food crises as one of the main societal problems, which is strongly interconnected with water crises, extreme weather, climate action failure and other risks. Strong sustainable innovations are needed and that is why plant-based meat alternatives were invented. But the environmental concerns are not the only driving forces, there are also concerns associated with human health and animal welfare. Plant-based meat refers to products made from plant materials that are designed to mimic meat in every way, from taste, texture, smell, and appearance. Plant-based meat can be healthier and vastly more sustainable than conventional meat. But the main question is: Are the consumers able to switch from traditional meat to plant-based meat?

This thesis aims to understand the Italian consumer behaviour towards plant-based meat and which are the driving factors and the barriers that influence the Italian consumers when it comes to consuming these specific products. To do this, it will be distributed a survey based on the Attitude-Behavior-Context (ABC) Model taking into consideration both rational perspective and habits of consumers. A specific focus will be put on the resistance to change aspect using the Oreg scale to understand how strong or weak is the general predisposition to change of Italians. In addition, the Self Reported Habit Index (SRHI) will be used to analyse how strong is the habit of consuming and buying traditional meat. As a conclusion, based on survey results and based on Habit Discontinuity Hypothesis, it will be given some advices and suggestions to companies that are planning to enter the Italian market with plant-based meat alternative products.

The thesis is composed of 5 chapters: market analysis and research; theoretical backgrounds; consumers' behaviour and survey; interpretation of the results and conclusion.

The first chapter of the paper aims to analyse and clarify the existing diets, such as vegetarian diet, vegan diet, lactovegetarian diet, meat-based diet and others. Moreover, there will be examined the driving forces for the development of plant-based meat alternatives. They can be classified into environmental, health and animal welfare concerns associated with traditional meat. Then, will be explored the history and the development of plant-based meat alternatives, from seitan, tofu and tempeh to the first generation of plant-based meat alternatives (PBMA 1.0) and the new generation of plant-based meat alternatives (PBMA 2.0). Also, this chapter will present the structuring process of plant-based protein, the techniques for creating a meat-like appearance and flavour, the selection of plant-protein sources and the safety controls associated with the creation and commercialisation of PBMA 2.0. Moreover, in this chapter, there will be analysed PBMA 2.0 brands around the world and in Italy. The United States represents one of the countries with the most numerous companies investing in this sector. For instance, American companies like Beyond Meat and Impossible Foods are the most famous. They distribute products all over the world consisting of burgers, meatballs, sausages, crumbles, tacos, skewers that are highly appreciated. Then, it will be analysed in detail the Italian market regarding the production and the distribution of plant-based meat alternatives and it will be highlighted the challenges in commercialising these products.

The second chapter is centred on the theoretical backgrounds which are essential in understanding the consumer's behaviour theory. Initially, the paper will present the existing studies that have been already done in the field of PBMA. Then, there will be illustrated which are the simple approaches in understanding consumer behaviour, such as segmentation based on socio-demographics and focusing on psychological demographics. However, these approaches are not enough because of the presence of a broad set of variables and that is why complex and structured models based on rational cognitive stream are needed: theory of reasoned action, theory of planned behaviour, norm-activation-model, value-belief-norm theory. But, these theories have some limitations, they do not take into consideration one important variable, habits. The Attitude-Behavior-Context (ABC) model and the Comprehensive Action Determination Model bring together the two perspectives,

rationality and habits. These two models will also be analysed and explained because the next chapter will be based on the ABC model.

The third chapter is about the survey. Initially, the research method will be explained, highlighting the ABC model variables and the objectives of the research. The hypotheses and the respective equations will also be presented in this chapter. To understand the Italian consumers' behaviour when it comes to the consumption of plant-based meat alternatives, this research will be based on primary quantitative data. It will be presented the questionnaire with the dedicated sections. The questionnaire will be distributed in Italian in an online format containing closed-ended and open-ended questions. At the end of this chapter, the paper will define validity, reliability and limitation aspects of the study.

The fourth chapter is focused on the results. There will be explained in detail the attitudinal factors, the contextual forces, the personal capabilities and the habits that influence or prevent consumers from purchasing plant-based meat alternatives. This chapter is divided into descriptive statistics and general analysis; factor and reliability analysis; hypotheses testing associated with the ABC Model variables; and hypothesis testing associated with demographics, barriers and concerns related to plant-based meat products.

Finally, the last chapter is focused on the general observations, academic and managerial implications based on obtained results, and suggestions for future research. A particular emphasis will be put on the suggestions for companies that are planning to enter the Italian market with plant-based meat products.

Chapter 1. Market analysis and research

1.1. Nutrition, factors affecting diets and definitions

During the time, people have developed many approaches to nutrition on the base of a variety of factors, such as religion, ethics, clinical needs or just the desire to control weight. The Oxford Dictionary of English defines nutrition as the "process of providing or obtaining the food necessary for health and growth", while diet represents the "kinds of food and drink that a person, animal or community habitually eats". The diets are composed of several food groups that collectively provide the nutritional needs for the body. Many governmental institutions provide information on their official sites to inform citizens about how to eat healthy underlying the importance of 5 food groups. For instance, the Australian governmental institution draws attention and classifies the 5 food groups in vegetables and legumes/beans; fruit; grain cereal food, mostly wholegrain and/or high cereal fibre varieties; lean meats and poultry, fish, eggs, tofu, nuts and seeds and legumes/beans; milk, yoghurt cheese and/or alternatives, mostly reduced fat (Appendix 1). The classification of the foods is based on the provision of similar amounts of the key nutrients between the same food group. To stay healthy, people need to eat a variety from each of the five food groups daily, in the recommended amounts. However, it is also important to consume a variety of foods within each of the five food groups because different foods vary in the amount of the key nutrients they provide.

Generally, we know the diets can be distinguished into: belief-based diets, calories and weight control diets, crash diets, detox diets, diets followed for medical reasons, fad diets, vegetarian diets and others. An important consideration is the fact that not all diets are healthy because some of them imply excluding one or of the food groups or some important ingredients. People follow those diets through habit, not through conscious choice to eat unhealthily or because of lack of information. In the book Human Nutrition 13e, by Catherine Geissler and Hilary Powers (2017), John Kearney and Gerda Pot affirm that "Individual's food choices at any given time will be influenced not only by what they consider to constitute

'food' and whether it is available (physically available or affordable), but also by what is appropriate according to a variety of sociocultural factors, ideas, beliefs, and attitudes as well as psychological factors and their level of hunger and satiety". They also highlight that the factors causing dietary variation are: biological and physical factors, economic factors, cultural and religious factors, personal and psychological factors, educational factors, food taste and appearance factors and extrinsic factors.

Biological and physical factors refer to the fact that human physiology puts some limitations on the food choice, in particular on the quantity and on the quality consumed (for instance, humans are mono-gastric and this fact renders impossible to digest plants with high fibre content). Other factors such as age, gender, pregnancy, lactation, and activity patterns affect nutritional requirements, but people are not able to perceive their specific needs and act in response. An exception is represented by newborns that consume only milk. They have the innate ability to regulate energy intake by adjusting the quantity of milk consumed in response to the level of dilution in order to maintain energy intake.

Economic factors that influence the dietary variation are related also to geographical and seasonal factors (food preservation, distribution system) and also to the financial ability of individuals to acquire food.
In rural areas, people's diets depend on what they decide to produce and what they decide to buy. Generally, in rural populations, people consume around 60% of the food they produce, while in the cities people depend almost on purchased food.
When food must be purchased, there are two important aspects: the overall level of expenditure on food and the types of food consumed. The World Economic Forum (2015) presents data demonstrating that in some developed countries, such as the US, Canada, Australia, UK, Switzerland, Ireland, and Austria the expenditure on food represents less than 10% of their income; while in developing countries, such as Nigeria, Kenya, Cameroon, Algeria, Kazakhstan, Philippines, Pakistan, Azerbaijan and Guatemala the expenditure on food represents more than 40% of their income.

Low income groups are extremely vulnerable to changes in food prices and other necessities. Any price increase may lead to the purchase of reduced quantities of that kind of food, leading to serious nutritional consequences.
An internationally observed phenomenon is that when people's income rises, they tend to purchase more animal source foods, fruits and vegetables avoiding cereals and roots/tubers. That is why, low income families eat less fruit and cheap meat cuts, such as meat pies and sausages.

Cultural and religious factors also affect what people choose to consume. Generally, the human race is omnivore, meaning it eats a variety of food of both plant and animal origin. Also, humans need to learn what to eat and this includes learning what is acceptable or not acceptable as food, what food is appropriate for different occasions and different people according to age, gender and social status. The preparation of food and how it is eaten is also influenced by the culture or society. In fact, it varies from country to country and changes over time.
Sharing food and drinks represent a manner to initiate or maintain personal relationships. When somebody invites to share food and drinks, the type of food consumed varies according to the nature of the relationship. For example, it can be casual with friends or formal with people who are less known and whom the host want to impress. In some circumstances, during events or wedding celebrations, food can be used to demonstrate status and prestige.

Food plays a special role in an individual's beliefs because food choices may determine who we are in a real sense. Food is eaten every day and it serves as a constant reminder of what we believe. For instance, the Islamic diet consists in consuming halal food, meaning permissible food. The opposite of halal is haram food (forbidden). Haram food includes alcohol, pork, and any meat from an animal that was not killed through the Islamic method of ritual slaughter. Another example is represented by the Rastafari movement. It is a religion developed in Jamaica during the 1930s and it includes a set of principles, one of it consists in consuming natural foods interpreted as becoming vegetarian or vegan. The Cambridge Dictionary defines vegetarianism as "the practice of not eating meat for health or religious reasons or because you want to avoid being cruel to animals", while

veganism is defined as “the practice of not eating or using any animal products, such as meat, fish, eggs, cheese or leather”. Veganism represents more a lifestyle, rather than a diet. Another important practice is Lacto-vegetarianism representing “the practice of not eating meat, fish, or eggs, but drinking milk and eating some foods made from milk”.

Personal factors, including emotions, personality, self-esteem as well as beliefs and attitudes play an important role in shaping eating habits. Food starts to be associated with emotions from birth as eating provides a pleasurable experience of comfort, security and well-being. During life, people learn to associate particular foods with feelings related to the circumstances in which they were eaten.
Positive feelings may be associated with foods given as a reward or eaten on special occasions with loved people, while negative feelings may be associated with foods eaten during periods of financial problems. Also, food can be a means to express feelings. For instance, when children feel anger or seek attention, they refuse to eat.

In the book Human Nutrition 13e, by Catherine Geissler and Hilary Powers (2017), John Kearney and Gerda Pot affirm that “within most societies, people who have more nutrition knowledge tend to have better diets”. So, education also contributes to food choices, however, it does not mean that just giving people more information about food and health, they will positively change their habits. For many people, the difficulty to have access to affordable healthy food and the lack of support from family and friends represent important obstacles in making changes.

Food taste and appearance is also a very important aspect when it comes to consumption. A range of senses, such as vision, smell and hearing, contribute to our perception of the appearance, texture, and flavour of foods. Colour is probably the most important visual aspect, but there are others, such as gloss, size, shape, surface texture that contribute to the perception of the food quality and appeal. There are 4 basic tastes quality: salty, sweet, sour and bitter. A further taste was identified in Japan, the umami taste. It has been demonstrated that infants have an innate preference for sweet taste and during their life, people learn to like a certain

level of saltiness. Also, by ageing people start to lose sensibility to taste and respectively it decreases the enjoyment of food.
The awareness of sensory attributes of food that appeal to consumers is very important for food manufacturers. Studies about how the senses interact in the experience of eating are fundamental for product formulation. For instance, consumers of a fruit drink with a deeper colour will have a perception of a stronger fruit taste.

Extrinsic factors, such as advertising represent a very powerful influence on food choice. Some groups of people are more susceptible to this influence. For instance, young children have high levels of recall of advertising and are more likely to request advertised products. Once children become older and have more money to spend, they are in a position to make their own purchases. An important consideration is the fact that the types of food that are advertised are often high in fat and simple sugars and this may have a distorting effect compared to fruits and vegetables that are less advertised. These factors have led some countries to put restrictions or bans on specific types of food, especially those targeted at children.

1.2. Environmental, health and animal welfare concerns

In this paragraph, the focus will be put on some specific factors that are changing day by day the perception of food and people's diets and habits: environmental, health and animal welfare concerns.

Nowadays, the environment and sustainability are the most important topics. Governments, private organisations and many people around the world are working together to change the conditions of the planet. The most feared catastrophe is climate change, but also nature loss, the unavailability of fresh water, air and water pollution, the growing quantity of solid waste and resource scarcity are considerable global problems that are strongly interconnected.
The Global Risks Report 2020 classifies food crises as one of the main societal problems and is described as "inadequate, unaffordable or unreliable access to appropriate quantities and quality of food and nutrition at a major scale". The

report also illustrates that it has a strong correlation with extreme weather, water crises, biodiversity loss and human-made environmental disasters (Appendix 2). The report indicates that in the last period climate change is striking harder and more rapidly than many expected. In particular, the last five years are the warmest on record and the natural disasters are becoming more intense and frequent. In the last year, it has been registered unprecedented extreme weather throughout the world. In addition, global temperatures are expected to increase by at least 3°C by the end of the century, twice what climate experts have warned is the limit to avoid the most severe economic, social and environmental consequences. Experts suggest that the short term impacts of climate constitute a planetary emergency that will include loss of life, social and geopolitical tensions and negative economic impacts.

Another important aspect is the fact that scientists determined that the world population will reach 9.8 billion people by 2050 with an estimated increase in demand for food and animal-based foods of 50% and 70%, respectively (Searchinger T., et al; 2019). The Global Risks Report 2020 underlines the fact that a more efficient use of land is critical because agriculture, livestock and deforestation produce nearly a quarter of global emissions. In addition, crop yields will likely drop in many regions, undermining the ability to double food production by 2050 to meet rising demand.

According to a study conducted by Gerber et al. (2017), livestock production accounts for an estimated 14.5 % of global greenhouse gas (GHG) emissions from human activities. In particular, meat and dairy from ruminant animals, such as cattle and goats are very GHG intensive (Clune et al., 2017; Santo R. E. et al., 2020). A research conducted by Tichenor et al. (2017) summarised that under specific soil, climate, and animal density conditions, well-managed grazing livestock may sequester carbon, thus lowering the GHG footprints of ruminant products. On the contrary, other research explained that this effect is time-limited, reversible, and potentially outweighed by other GHGs generated by grazing systems (Garnett et al., 2017).

Hallström E., et al. (2015) affirm that dietary change can be an effective approach to reduce greenhouse gas emissions, but also land use demand. It has been demonstrated that a vegan diet can achieve from 25% to 55% reduction of greenhouse emissions and 50% to 60% reduction of land use demand. Moreover, Reijnders L. and Soret S. (2003) summarised that the land use, water requirement, fossil fuel requirement, and phosphate rock requirement for meat protein food production are several or even a dozen times higher than for soybean-based protein foods. In particular, beef requires the most resources for production and it is the largest contributor to global warming of all animal products on the market (He J. et al., 2020).

A study conducted by Machovina et al. (2015) and a study conducted by Bouwman et al. (2013) identified that when compared to the production of crops for human consumption, livestock production, as an industry, contributes considerably to biodiversity loss and disruptions in nutrient cycles that increase groundwater pollution and eutrophication. Eutrophication is a process that occurs when excess nutrient levels cause toxic algae blooms that decreases oxygen levels in the water, thus killing fish, plants, and other aquatic life. Studies suggest that the resource inputs and the associated impacts may be reduced with agroecological approaches, such as integrated crop-livestock, multi-species farming, and well-managed pasture-based livestock production systems in general (Santo R. E. et al., 2020). In addition, these approaches can also provide other ecological services including reducing dependence on synthetic fertilisers through nutrient recycling, fostering soil health, and sustaining the biodiversity of grassland ecosystems (Janzen, 2011; Röös et al., 2017; Martin et al., 2020).

When it comes to food production, energy also represents a valuable resource as well as land and water. Many studies have demonstrated that traditional meat production is unsustainable and is considered an inefficient process compared to crop harvesting. Djekic (2015) concluded that over 70% of the energy used during production is either lost through excrements or consumed during animal body growth and development.

Furthermore, a study was conducted to select a suitable meat replacer that poses similar nutritional value, but lower environmental impact. There were compared 4 types of meat replacers: vegetarian, vegan, insect-based, and fortification-free (foods that have nutrients added to them that don't naturally occur), and the result indicated that vegan replacers can reduce up to 87% of indicators such as climate change, land use, and fossil fuel depletion (Van Mierlo et al. 2017).
Summarising all these studies, they have demonstrated that changing the global food production system to more sustainable methods by focusing on plant-based alternatives will contribute to protecting limited natural resources and ensuring that a sustainable environment can be maintained for human survival.

It is commonly known that consuming meat represents a healthy way to provide the human body with necessary nutrients and energy. However, in the last period, meat has been subjected to some controversies. The WHO's International Agency for Research on Cancer (IARC) has determined that processed meat is carcinogenic (Group1), while red meat such as beef is a probable source of cancer (Group 2A) to humans. Some evidences correlate these groups of meat to colorectal cancer (Bouvard et al., 2015; Godfray et al., 2018). The main problem is the fact that most of the meat currently on the market is processed, such as smoked meat, ham, bacon, and sausages, while beef and pork are globally the most consumed and both belong within the red meat category. Moreover, studies have shown that there is a correlation between high consumption of processed and red meats and elevated mortality rates, but direct evidence is still insufficient.

In their studies, Bouvard et al. (2015) and also Godfray et al. (2018) affirm that the probably carcinogenic property of processed and red meat could be attributed to the toxicants that arise during the production process as well as the presence of rich saturated fatty acids within these products. Other dangerous factors include heme iron, which has the potential to increase the chance of stomach and oesophageal cancers and the presence of high level of salt can cause spike in blood pressure (Ward et al., 2012; Blaustein et al., 2011).

There are also other health concerns associated with meat consumption, such as meat-borne infections. For instance, Creutzfeldt-Jakob disease is believed to be caused by the transmission of pathogens from bovine contaminated beef products to humans (Chen et al., 2013). Moreover, the start of the viral African swine fever in countries such as China in 2018-2019 is another example of potential infection from meat consumption (Zhang et al., 2019).
In addition, the wide use of antibiotics as veterinary drugs for livestock might result in antibiotic resistance those genes might transfer from farm animals to human pathogens, hence resulting in the development of superbugs with multi-drug resistance, such as methicillin-resistant Staphylococcus aureus (Bernier-Lachance et al., 2020).

Changing the current dietary patterns to plant-based diets might benefit not only the environment but also human health. Numerous studies have indicated the benefits of switching to plant-based proteins, including reduced risks of type 2 diabetes, heart diseases and strokes (Fehér et al., 2020). Another study has estimated a reduction of the global mortality rate by 6% to 10% associated with the transition from heavy meat to plant-based diets (Spingmann et al., 2016). Due to these studies, in recent years, many consumers have aimed to reduce or avoid the consumption of meat. Therefore, the development of a wider variety of plant-based meat alternatives can decrease global meat consumption and maintain human health.

Many people believe that consciousness exists in nonhuman animals and that the well-being and suffering of animals cannot be ignored. Many developed countries have introduced legislation to ensure that animal needs are met. In fact, many governments and non-government animal welfare organisations, such as the World Organisation for Animal Health (OIE), have been created to further protect and support animals.

Grandin T. (2014) underlines that the meat industry is an area with serious concerns for animal care. In particular, livestock is often faced with stressful situations during treatment on farms, transport, and slaughter. On farms, problems

arise from poor farm management practices, such as beating, throwing, or kicking. Also, health issues may arise from breeding that is often severely neglected by farmers. For instance, cattle are frequently left to suffer from advanced ocular neoplasia, whereas pigs may succumb to necrotic rectal prolapse. Also, high death rates and injuries are very common during transport to slaughterhouses. For example, animals may be driven off trucks through the use of excessive force. Although improved transport systems and experienced drivers can reduce the harm to animals, these issues cannot be completely eliminated. The slaughter process is where the main concerns for animal treatment exist. According to the standard of animal welfare, the pain and distress of livestock should be kept to a minimum during slaughter, that is why, standard operating procedures, such as pre-slaughter stunning together with auditing programs have been established to maintain reliable animal welfare standards. But, the well-being of animals can be compromised by the improper handling of stun devices or the use of employees that lack proper training. An investigation in a Mexican plant demonstrated that only 51% of cattle become insensible after a single shot and 10% vocalise during the stunning process (Miranda-de la Lama et al., 2012).

Shields S. & Grager M. (2013) affirm that another major source of animal welfare issues is connected to extremely high densities of animals in the livestock. These farming systems bring elevated levels of stress and high risk for diseases. For instance, through livestock, animals are denied of their natural behaviours contributing to invasive procedures like castration, and often exhibit abnormal actions, such as cannibalism. Moreover, other issues are caused by the artificial selection of livestock with desired production properties. For example, chickens have an increased probability of developing leg deformities or ascites, due to their high growth rate and large breast muscles.

Therefore, consumers have become increasingly aware of the treatment and lifestyle of livestock and many have developed serious concerns for the overall well-being of the animals. Hopwood C. J., et al., (2020) underline that this aspect, together with environmental and health aspects have been the main contributors to the shift toward vegetarianism and veganism in many Western societies.

1.3. History and development of plant-based meat alternatives

The development of plant-based meat alternatives products has taken many years to become as they are now, however, there can be distinguished three phases: traditional processed plant-based protein products, the first generation of Plant-based Meat Alternatives (PBMA 1.0) and the new generation of Plant-based Meat Alternatives (PBMA 2.0).

The traditional plant-based protein products include tofu, tempeh and seitan and they are typically used as a protein alternative in Buddhist and vegetarian dishes. They all have an incredible story of development. First of all, records of tofu-making can be traced back to 2000 years ago in the Chinese Han Dynasty. Initially, they prepared tofu by preparing the soy-milk and coagulated it with salt or acid to form curds and the resulting curds were pressed into solid white blocks (Chang & Hu, 2003). Then, the technology of tofu production has spread to other East and Southwest Asia, such as Japan, Vietnam, Thailand, and many varieties of the product began to emerge.

Tempeh is another meat alternative made from soybeans. Babu P. D., et al. (2009) affirm it originated in Indonesia a few centuries ago. To prepare this product, soybeans are soaked, hulled, and partly cooked first, and then fermented by Rhizopus fungus to obtain a solid structure. The prepared soybeans are commonly wrapped in banana leaves or suitable plastic materials to obtain moderate aerate conditions that are necessary for mould growth without excessive sporulation. The fungi and mould that grows on the soybeans solidify the whole beans into a nutty, condensed cake.

Another type of traditional PBMA is represented by seitan, also known as wheat gluten (WG). It was invented in China during the 6th century. It is different from tempeh and tofu, as it is made from gluten, a major protein found in wheat. During the production of seitan, water is used to wash a wheat flour dough until each of the starch granules are removed and the sticky insoluble gluten is left as an elastic mass. It is structurally similar to meat and its distinct property is that it can be shaped to look like special meat products, such as vegan chicken wings and vegan mock ducks (Day L., 2011).

The first generation of PBMA (1.0) has been invented due to the increasing number of vegetarians, especially in developed Western countries. People changed their habits because of religious beliefs, animal rights, health benefits and personal preferences. The first generation of PBMA (1.0) includes TVP (Textured Vegetable Protein) products. Initially, TVP was a registered trademark, but it is now used to define products that derive from edible vegetable protein mixed with minor ingredients or chemicals. Then, this fusion is used to create similar structural and textural properties as consumable meats (Riaz, M. N., 2001; 2011). Soybeans are considered the largest global source of protein alternatives, but other vegetable proteins can be used as well as raw materials for PBMA, for instance, landless cottonseed flour, canola or rapeseed concentrated, and defatted peanut flour. The most widely used method to create similar textures and tastes to meat is represented by extrusion. It will be explained in the next paragraph. Currently, on the market, there can be found products based on TVP consisting in analogues of hamburger patties, hot dogs, bacon, lunch meat, and ground beef.

Studies conducted by Rohall S. et al., (2009) and Wild F., et al. (2014) highlight the fact that both traditional PBMA and PBMA 1.0 are accepted by vegetarians who do not like the taste of real meat. However, there are many consumers who are not satisfied with the appearance, flavour, and taste of these products, but at the same time, they have the desire to be more sustainable, to eat healthily and to protect animals. That is why in recent years PBMA 2.0 were invented. These products can be produced thanks to the technologies that are also used for TVP production to form meat-like texture, but their appearance, nutritional facts, aroma, and taste are also similar to authentic meat products.

There are 3 most famous manufacturers of these new-generation products: Beyond Meat™, Light life™, and Impossible Foods™. Comparing the nutritional components of the plant-based burgers they offer, such as energy, proteins and fats, it can be observed that they are more similar to beef burgers than other plant-based burgers. Moreover, the new generation of PBMA aims to have a similar appearance and colour to fresh raw meat. Bohrer B. M. (2019) states that in order to do this practice, Beyond Meat and Light life use beet juice or powder to “bleed” their

burger paddy, whereas Impossible Foods employs soy leghemoglobin in its burger products to create a red colour. Nowadays, burger patties are the main product of the new generation of PBMA, but there are also other types of products, such as ground beef, sausage, bacon, and hotdogs.

1.4. Manufacturing, production and safety controls

The challenges in the manufacturing process of PBMA 2.0 products consists in creating structure, appearance and flavour similar to meat.
The structuring process is at the base of the texture formation of these products. The objective is to develop fibrous structure and texture as the meat has. Dekkers B. L. et al. (2018) have studied the techniques of creation of different meat analogues and they can be divided into 2 strategies: bottom-up and top-down. The bottom-up approach consists in combining each structural element to generate the final product, while the top-down approach consists in creating a fibrous texture through the formation of a biopolymer blend.
Commercial operations for PBMA processing often use the top-down strategy extrusion, due to its robustness and possibility to mass-produce on a large scale. But, there are also new developed top-down strategies used at the research stage, such as shear cell technology (pilot scale), wet spinning, electrospinning, mixing with hydrocolloids and ice/freeze structuring.
Extrusion represents a well-developed technology in the food industry and it was first used to manufacture pasta during the 1930s. The process consists in transforming food mixtures by driving them through a die, applying heat and pressure, and using a mechanical shear to obtain the desired sizing (Maskan M. & Altan A., 2016). This technique is widely used because it permits mass production of meat analogues with high energy efficiency.

Creating a good appearance is another challenge for the production of PBMA products. For instance, colour is the main contributor to the perception of taste and overall product acceptance by consumers. PBMA products should have the appearance of real meat, being red when uncooked, and turning brown upon

cooking. However, most plant-based protein ingredients, such as gluten and soy, are originally yellow or beige in nature.
Bohrer B. M. (2019) explains that currently, to obtain the red colour for the realisation of the new generation of PBMA, it is added beet juice/powder or soy leghemoglobin. A significant consideration is the fact that the thermal stability and pH sensitivity of the colouring agents are very important because thermally unstable colouring agents will degrade during the cooking process and may lead to unacceptable colour appearance. To ensure that the colouring effect is optimal, the pH range of a given colouring agent should match that of the meat analogue. Despite the numerous colouring agents and application methods, the overall colour appearance of PBMA remains low and further research is needed.

Another important factor in the PBMA product acceptance is the flavour. To create a flavour similar to real meat is very complex compared to creating the colour. Kyriakopoulou K. et al., (2019) state that the flavouring agents can be divided into volatile and nonvolatile compounds that are related to the aroma and taste, respectively. Meat has an umami taste and the main challenge consists in trying to mimic the aroma of meat in PBMA. From the current analysis of flavour compounds, it has been demonstrated a significant difference between beef burgers and the first and second generation of plant-based burgers. However, there has been some progress from the first to the second generation in the flavour mimicking process of PBMA. It also has been demonstrated that the addition of spices and salt to plant-based food mixtures both before and after the extrusion process, can improve the flavour of the final products. Despite all the techniques to mimic the flavour of the real meat, further studies in identifying meat-like aromas in PBMA products are needed.

The selection of plant protein is very important for the creation of PBMA 2.0 products. Different types of proteins can produce different appearances, flavours, nutrition and health impacts within the final product. Currently, soy and peas are the main sources used for the industrial manufacture of meat analogues. This is due to their low costs and their possession of some properties similar to meat.

There have been conducted some studies to compare different sources of proteins and they concluded that proteins obtained from legumes such as chickpeas and soybeans are ideal for PBMA production, whereas proteins from insects and zein are among the most cost-efficient options (Jones O. G., 2016). Also, oilseeds provide an adequate source of amino acids, particularly when paired with dry foods, such as cereal (Asgar M. et al., 2010). Moreover, it has been studied that also mushrooms can be an option for meat analogue production, even if they are not plants. Mushrooms are rich in biological activity components and can provide many health benefits, including antitumoral potential (Rathore H. et al., 2017). Furthermore, some waste biomasses can be also a source of protein for PBMA, such as peanut protein biomass waste with high-moisture extrusion. This method could help to reduce waste products and to decrease the amount of resources needed for food production.

Megido R. C. et al., (2016) affirm that Western countries have begun the gradual acceptance of insect-based meat as an alternative to real meat. There are many difficulties in mass production to fulfil global market requirements, but a solution could be to include partially insect-based protein into PBMA.

Food safety represents a fundamental aspect for PBMA production and compared to the real meat, PBMA products have limited scientific data related to safety. However, in general, PBMAs have a great risk of microbial growth and reproduction as they provide high-moisture environments with neutral pH. A European research project was conducted to analyse the microbial control of PBMA and it concluded that post extrusion thermal treatments must be carried out to prolong the commercial shelf life (Wild F. et al., 2014). Also, a significant reduction of microbial activity was observed when stored at 6 °C for prolonged periods. Therefore, it is highly recommended that the system for the storage of PBMA remains similar to that of raw meat. Despite many studies about ingredients and chemical contaminants, additional research must be carried out to further evaluate the food safety of PBMA.

1.5. PBMA companies around the World and in Italy

In the previous paragraphs, it has been underlined that the most famous companies regarding the production and the commercialisation of PBMAs 2.0 are represented by the American companies Beyond Meat™ and Impossible Foods™. However, there are many other companies already present in this market, some of them are big and sell worldwide, others are start-ups. An important factor is that the industry of plant-based meat alternatives is attracting more and more investors and meat companies are ready to convert their production process in order to be ready to satisfy also plant-based meat alternative demand.

According to a new report of Bloomberg Intelligence (BI) (Press Announcement, August 11, 2021) "the plant-based foods market could make up to 7.7% of the global protein market by 2030, with a value over $162 billion, up from $29.4 billion in 2020". Moreover, according to this report, big companies, such as Beyond Meat, Impossible Foods and Oatly are increasing their product line as they collaborate with international restaurants and major chains, such as Taco Bell, Chipotle, Jamba Juice and Starbucks. In the meantime, other more traditional companies such as Kellogg and Nestlé have also started to produce and distribute plant-based products and are investing in promotional campaigns to show their variety of options. As consumers become familiarised with plant-based products and initiatives, Bloomberg Intelligence foresees an evolution in consumer habits over the next decade.

The Asia-Pacific region is particularly exposed to changes regarding the food industry, as the population is expected to grow considerably by 2030 and their food supply is limited. As a result, "the Asia-Pacific region is likely to dominate the plant-based protein market reaching $64.8 billion by 2030, up from $13.5 billion in 2020 and its share is expected to be around 57% by 2030. Comparatively, Europe and North America will see roughly $40 billion in sales, with Africa, the Middle East and Latin America all seeing between $8-9 billion each".

The main manufacturers of plant-based meat products which sell in many countries are Beyond Meat, Impossible Foods, Kellogg, Amy's Kitchen, Maple Leaf Foods, Pinnacle Foods, and others.

Starting from Beyond Meat, it represents a popular brand that is offering plant-based protein foods that can be purchased in the form of burgers, sausages, meatballs, strips, crumbles, and a lot of other variants. According to the company, the major ingredients of their plant-based protein foods include water, expeller pressed canola oil, rice protein, pea protein isolate, refined coconut oil, and a few other natural flavours such as beet juice extract and apple extract. Their strategy is to reach consumers directly in the supermarkets and also through partnerships through international restaurants chains (Pizza Hut, Panda), but also through local restaurants worldwide. Every restaurant can become a partner of Beyond Meat. Moreover, it has recently launched an e-commerce site making its products more widely accessible across China. Furthermore, Beyond Meat is selling worldwide through its website. In addition, on the website, there is a map where people can find the most nearby restaurants offering their products or just the selling points.

Impossible Foods is another famous brand. It was established in the United States in 2011 and was founded by Patrick Brown. He was a Stanford biochemistry professor and his intention was to create a solution to one of the biggest problems on the planet. The company develops plant-based substitutes for meat, dairy and fish products by selecting specific proteins and nutrients from greens, seeds and grains to recreate the experience of these products. Impossible Foods focuses on researching various animal products at a molecular level. Once they identify the various protein and nutrients required to create the nutrition and experience of meat products, they recreate the same with the help of various plants. Their most popular product is the meat-tasting vegan burger that is currently valued at over $4 billion and it can be found in restaurants such as Burger King and White Castle and over 8,000 grocery stores around the US. The strategy of Impossible Foods regarding the distribution is similar to that of Beyond Meat, but they are less present worldwide and they do not have an e-commerce website. However, they are present in the Asian market and recently made available their products in about 200 grocery stores in Hong Kong and Singapore, in nearly 100 outlets of PARKnSHOP in Hong Kong, and nearly 100 outlets of FairPrice in Singapore and they are also selling online through the retailer RedMart.

Kellogg is one of the biggest companies in the world and it represents the world's largest cereal producer. Moreover, due to the growth of the plant-based food market, it decided to create or buy some brands in this market, like MorningStar Farms, Incogmeato, Kashi and Gardenburger. MorningStar Farms was first established in 1975 in Michigan, U.S., then it was acquired by Kellogg and now it produces various vegan and vegetarian foods, and most of their products are variations of popular meat-based products. The brand produces products that include burgers, chicken to meat starts and breakfast items. Incogmeato represents a brand product line of MorningStar Farms and it includes plant-based chicken, beef and pork. Kashi is a brand associated with breakfast plant-based protein including products such as cereal, bars and waffles. Gardenburger is a brand that does not have so many products, but it specialised in vegetarian burgers that do not taste like meat.
All these branded products are available in supermarkets chains in particular in the U.S. but can be found also online on Amazon, Target and Instacart in different countries.

Amy's Kitchen was one of the first brands to create plant-based foods. Now it provides natural, organic, frozen and pre-packaged vegetarian meals, as well as organic frozen entrees, pizzas, convenience foods, canned soups, beans and chilli, jarred sauces, salsas and other products. The company sells its products through various natural food stores, supermarkets and club stores. One of their first creations was a vegetable pot pie made with a trademark homestyle crust. This pot pie became very famous and elevated the brand into the public eye. Today, the products made by Amy's Kitchen can be found in over 23 countries from around the world, including the U.S., the UK, Australia, Canada, China, Hong Kong, Israel, Japan, Mexico, South Korea, Thailand and the United Arab Emirates. The brand employs over 2,700 people and is continuing to spread the good message of the benefits of eating plant-based meats.

Maple Leaf Foods is a Canadian company that manufactures and sells a variety of food products that includes fresh and prepared meats, poultry, flours, pasta, seafood and pet and animal feeds. These products are primarily sold to retail,

foodservice, wholesale, agricultural and industrial customers worldwide. Maple Leaf Foods owns a brand named Greenleaf Foods that represents other two brands in the field of plant-based meat: Lightlife and Field Roast. Lightlife has a wide portfolio of plant-based protein products and is a brand reference for the production of tempeh and a plant-based hot dog in the U.S. It offers more vegan-certified and non-GMO plant-based protein products than top competitors, including burgers, hot dogs, grounds, tempeh, sausages, deli meats and more. In the last 12 months, the brand has reinvented its portfolio by removing unnecessary ingredients and "obliged" other brands in the category to do the same. The other brand, Field Roast is an artisan vegan meat company offering products that include sausages, burgers, meatloaves, deli slices, frankfurters, roasts and more. The brand is famous for its "Celebration Roast" which is extremely popular over the holidays and is also available year-round. This is widely considered the best vegan Thanksgiving turkey alternative on the market. Field Roast differs from other vegan meat companies because it doesn't aim to replicate the texture of animal meat. Instead, the products have the flavour of grains and vegetables in their less processed form. The company's products can be found in many groceries and most natural food stores in the USA. The company also makes vegan corn dogs, chicken nuggets, Buffalo wings, and three varieties of deli slices.

In Italy, there can be found many international plant-based brands in different places. For instance, Beyond Meat products can be found in supermarkets such as Alì & Alìper, Esselunga and Carrefour, or in the local burger and vegetarian restaurants. Moreover, the products can be found on Amazon or directly on the official site. Also, Lild supermarkets made available plant-based burgers. They are called Next Level Burgers and correspond to the Lild brand: Next Level Meat. Moreover, they are less costly compared to Beyond Meat burgers, 4 euro and 10 euro, respectively. Another international brand that can be found in the majority of Italian supermarkets is Garden Gourmet with their top product Sensational Burger. It is a Nestlé brand and offers vegan products trying to mimic original meat. The cost of the Sensational burgers is around 3.50 euro. Then, there are brands, such as Sojasun or Kioene that offer vegetarian burgers that have the taste of natural ingredients and do not target meat lovers.

There are also Italian companies that are producing plant-based meat alternative products, for example: Valsoia, Granarolo, Joy Food and Emilia Foods.

Valsoia was founded in 1990 and produces plant alternatives to milk, cheese, yoghurt, ice cream, burgers and meatballs by using the nutritional properties of soy and other vegetables. For instance, their plant-based burgers are composed of proteins extracted by peas. This product cost less than 4 euros and can be found in the freezer division of many supermarkets.

Granarolo is a big Italian company that produces a variety of products, such as traditional milk, yoghurt, ice cream, cheese, pasta and others. However, due to the growing market of plant-based meat alternatives, it decided to enter this market with one product, the Unconventional Burger. It is very similar to traditional meat, its cost is around 4 euro and can be found in different supermarkets.

Joy Food is a small company founded in 2014 and produces plant-based meat alternatives. It is highly specialised in the production of chicken, bacon and beef and the brand associated with these products is Food Evolution. The products are frozen, can be found in the supermarkets Esselunga and do not cost more than 3 euro.

Emilia Foods represents a small company founded in 2013, but it is growing very fast. It offers different types of products, having a distinctive brand, called Via Emilia which is specialised in plant-based products similar to American brands. Via Emilia distinguishes the products that are selling in Italy and internationally (America, Asia). However, it offers a vast product line to both markets, such as hot dogs, burgers, meatballs and nuggets. In Italy, their products can be found on bio e-commerce sites, such as Bio Salute, iVegan; in Despar, Eurostar, Interspar and Rossetto supermarkets; also in different restaurants in Rome, Ferrara and Bologna.

Summarising the information about Italian companies, it is important to highlight the fact that there are many startups and big companies that are entering the

market of plant-based meat foods or are adding a new production line to not losing an important market share in the food sector. With respect to the American market, the Italian companies are still limited by offering few types of products and mainly selling within national borders. Also, the distribution system is quite poor and more strategies are needed to make plant-based meat alternatives more acceptable by consumers.

Chapter 2. Theoretical backgrounds

2.1. Existing studies

The growing market of meat alternative products is becoming more and more attractive. Hence, there are many studies regarding this topic. Some studies consist in comparing all the meat alternatives, such as plant-based meat, insect-based diet and cultured meat trying to understand their potential role in the future meat market, other studies are concentrating on identifying consumers' associations, perceptions and the level of acceptance of meat and plant-based meat alternatives. In addition, some studies are trying to identify what are the driving factors and barriers influencing consumers with a focus on a specific country.

The article "A systematic review on consumer acceptance of alternative proteins" (Onwezen M. C. et al., 2020) highlights that in 2014 there were published only three studies regarding the field of alternative proteins, while in 2018 there were conducted 16 studies and in 2019, 37 studies. Moreover, the results reveal an unequal distribution of articles across the different alternatives proteins: 9 articles on pulses (edible seeds of plants in the legume family, such as dry beans, dry broad beans, dry peas, chickpeas, cowpeas, pigeon peas, lentils and others), 9 articles on algae (it has proven to be a reliable and promising source of protein), 58 in insects, 9 on plant-based meat alternatives, and 16 on cultured meat. Furthermore, the majority of studies were conducted in the Netherlands (20 studies), then in Italy (17 studies), in Germany (13 studies), in the United States (9 studies), Australia (8 studies), Belgium (7 studies), the United Kingdom (5 studies), and Switzerland (6 studies). Regarding the types of study designs, the majority of studies include a survey (46), also there have been conducted experiments (40 studies), there have been convicted focus groups (7 studies) and have been done interviews (5 studies).

One article that I would like to enhance is "Consumers' associations, perceptions and acceptance of meat and plant-based meat alternatives" by Fabienne M., et al. (2020). The research aims to identify the barriers that keep people from consuming meat alternatives by exploring free associations people have towards

meat and meat vegetarian alternatives. Also, the study focuses on comparing selected meat products with their respective meat alternatives using the semantic differential and explores the perceived appropriateness of eating meat alternatives in different consumption situations.

To achieve these objectives it was conducted an online survey with 1039 participants from Germany. The results show that meat is associated with positive terms, such as “delicious”, “food”, “steak”, while meat alternatives were viewed more negatively, such as “tofu”, “vegan”, “disgust”. One possible explanation for the generally negative view of meat alternatives could be that meat eaters might have had bad experiences with vegans or vegetarians refusing offered food or demanding special treatment. As meat alternatives were associated with being vegetarian or vegan, this could have reinforced their negative beliefs about meat alternatives. Another possible explanation can be the fact that unpleasant memories about tofu and other vegan or vegetarian products might prevent people from trying meat alternatives again. An interesting fact is that for meat, associations between females and males were different. While females reported concerns about animal welfare and the environment and indicated moderated meat consumption, males thought of the positive aspects of meat such as taste and variety.

Regarding different consumption situations, the results show that eating meat alternatives is perceived to be more appropriate in situations where one eats alone or with its family, while the appropriateness of eating meat alternatives when invited for dinner at a restaurant, for a business meal, or a barbecue party were low. This proves that people are likely to adapt their eating behaviour to the eating behaviour of their peers. That is why, in more formal situations and circumstances where certain peer pressure is likely to be present, people might not want to attract attention or are afraid of being judged.

In conclusion, the results show that it does not make sense to strive for a meat alternative that replaces steak. Much more promising is the approach to replace processed meat products such as chicken nuggets or wiener sausages with a plant-based version as in these products, often not the meat itself, but a breadcrumb coating, a sauce or spices are responsible for a positive eating experience. So, the meat alternatives have the best chance of successfully replacing meat when they

closely resemble highly processed meat products in taste and texture and are offered at competitive prices.
This study represents a good example and there are many things to take into consideration when studying the situation in Italy regarding the consumers' perceptions, the consumption circumstances and product acceptance.

Since the meat alternatives market of the Asian region is expected to grow in the next years, I would like to present another study called "Factors Affecting Consumers' Alternative Meats Buying Intentions: Plant-Based Meat Alternative and Cultured Meat" by Hwang J., et al. (2020). The objective of the study is to identify the features of alternative meat that affect consumers' purchasing intentions by exploring the positive and negative feelings toward alternative meat. In particular, it was studied how the willingness to buy plant-based meat alternatives and cultured meat is influenced by ethical viewpoint(sustainability and unnaturalness), food safety (drug-free cleanness and distrust of biotechnology) and initial reaction (food curiosity and food neophobia).
First of all, it is important to clarify that cultured meat is defined as a meat substitute made in a laboratory (Mattick C.S., Allenby B.R., 2012). This novel meat, also called "lab-grown meat", "in vitro", or "clean meat", is produced through the in vitro culture of animal muscle cells. Since cultured meat production has not been the dominant approach, many institutions are still introducing and testing various aspects of various methods.
To study the consumers' intentions and perceptions, an online survey was conducted and 1017 people from Korea participated. They were separated into 2 groups: 513 people answered the questionnaire about cultured meat and 504 people answered the questionnaire about plant-based meat alternatives.
Comparing the two types of alternative meat, the results showed that the major difference can be observed in the variables of sustainability and food neophobia. Sustainability seems to be not so important when it comes to cultured meat, while it is very important in plant-based meat alternatives. That means that many people care about sustainable livestock production, but it does not mean that their willingness to buy cultured meat is high. On the contrary, the results of the plant-based meat alternatives survey show that people who care about sustainable

farming, like non-factory farming, are more likely to buy plant-based meat alternatives. A possible reason could be the fact that it is well known in Korea that plant-based diets are more sustainable than meat-based diets.

Food neophobia is an attitude formed by consumers to protect themselves from uncertain food and it could be a barrier to an initial trial. Food neophobia represents the unwillingness to eat and/or avoidance of novel foods. The survey results show that food neophobia was significant in cultured meat, but not in plant-based meat alternatives. Moreover, it has been found that not only in Korea but also in many other countries, food neophobia has a negative effect on the acceptance of cultured meat because it has not been yet commercialised in the market and it represents an unfamiliar type of food. Instead, for plant-based meat alternatives, food neophobia does not influence purchase intention. The reason for this is that an increasing number of people have become vegetarian and try to reduce their meat consumption. So, plant-based meat alternatives could be familiar to many participants. However, this aspect might not be the same in other countries.

Other factors affecting the willingness to buy of the consumers regarding both alternatives of meat are food curiosity, unnaturalness and distrust of biotechnology. Food curiosity is significant in both cases and represents one of the strongest motivating factors. While it could be easy to make people try new food, it could be also very hard to create a lasting long-term relationship with the customers. Unnaturalness makes consumers feel that alternative meat has an ethical problem. People who think that the way cultured meat and plant-based meat alternatives are made is unethical are not willing to try alternative meat. Moreover, unnaturalness can be linked to food safety concerns. Actually, the study participants who worried about biotechnology showed low willingness to buy alternative meat. The application of this technology is novel, so more regulations may be needed to decrease distrust.

Finally, the study gives some advices to the companies to be more appealing. For instance, the plant-based meat alternative marketer should be aware that consumers respond to ethical viewpoints, including sustainability and unnaturalness. So, it could be effective to emphasise the sustainability and the specialness aspects by using words such as “sustainable livestock” and “eco-friendly meat”.

This study is focused only on the Korean perspectives and associations, however, it could be useful to explore the same aspects in the Italian region, focusing more on plant-based products.

2.2. Simple approaches and social demographic variables

When it comes to make research in a specific field about the consumers' behaviour, the most simple approaches are represented by segmentation-oriented approaches. For instance, through this type of approach, are investigated the features (socio-demographic variables) connected to the individuals that consume or are willing to consume plant-based alternative meat products. So, the typical research method consists of surveys assessing special types of behaviours and connecting them with a broad range of variables such as age, gender, income, and so on. Evidences emerging from such surveys might suggest that young people tend to be more curious about new types of food than elderly people, so they are more likely to try plant-based meat alternatives compared with elderly people. Other research might suggest that women tend to be more sensitive to animal suffering and consequentially might buy more PBMA products compared to men. However, this type of approach is not enough and might lead to apparent results without going deeper into the topic.

The researches in the field of plant-based meat alternatives are recent and the majority of the surveys that were conducted were not focused only on the socio-demographic approaches because scientists are aware that this approach might produce insufficient results. For example, in other fields, when analysing the sustainable behaviours of the customers, it was mainly in the early research phase that the correlation between socio-demographic features and sustainable behaviours was adopted as the main perspective of analysis (Lanzini P., 2018). Also, in this field, the predictive capability of such an approach proved to be inadequate.

While there are few studies concentrated only on the simple approaches regarding the typical plant-based meat consumer, numerous studies are aiming at profiling the typical consumers that have a vegetarian or a vegan diet. However, the target of plant-based meat products is represented not only by vegetarians and vegans but also by meat lovers. Many vegetarians and vegans do not like the taste of meat and are not interested in plant-based meat alternative products. Therefore, it is wrong to focus on profiling only vegetarians and vegans when studying the consumers or possible consumers of plant-based meat alternative products.

When analysing the studies about multiple alternative proteins, some of them claim that demographics contribute to the understanding of consumer acceptance of alternative proteins (gender: Gómez-Luciano et al., 2019; Orkusz et al., 2020); however other studies claim that demographics are insignificant (gender: Barton et al., 2020; Birch et al., 2019b; de Boer et al., 2013). In general, we can conclude that the explained variance of demographic variables is generally low, as they only explain some aspects of the acceptance of alternative proteins (Grasso et al., 2019).
That being said, a common theme can be discussed throughout the results of the many studies. Individuals who are young and highly educated (Birch, Skallerud, & Paul, 2019a; de Boer et al., 2013; Gómez-Luciano et al., 2019; Grasso et al., 2019; Siegrist & Hartmann, 2019; Wilks et al., 2019), are not politically conservative (Wilks et al., 2019), live in urban areas (de Boer et al., 2013), or are vegetarian or vegan (insects: Rumpold & Langen, 2019) are more willing to accept alternative proteins. To confirm these findings a study conducted in the U.S. concluded that "vegetarians, males, younger, and more highly educated individuals tend to have relatively stronger preferences for the plant and lab-grown alternatives relative to farm-raised beef" (Van Loo E. J., et al; 2020).
Considering insect-based products and plant-based products as a protein source, gender seems to be significant. Insects are more accepted by males (Cicatiello et al., 2016; Grasso et al., 2019; Lammers et al., 2019; Laureati et al., 2016; Orkusz et al., 2020; Schäufele et al., 2019; Sogari, Menozzi, & Mora, 2019; Woolf et al., 2019), whereas plant-based alternative proteins are more accepted by females (plant-based alternatives: Gómez-Luciano et al., 2019; Melendrez-Ruiz et al., 2019).

Another study conducted in nine countries (China, USA, France, UK, New Zealand, Netherlands, Brazil, Spain, and the Dominican Republic) underlines that personal values and psychological demographics are also relevant. The researchers found that "consumers' behavioural intentions towards both plant-based and insect-based alternatives are inhibited by food neophobia but to an extent, are amplified by the perceived suitability and benefits of the protein, which in turn are driven by nutritional importance, environmental impact, healthiness, and sensory attributes for both alternatives" (Wim de Koning et al., 2020). This suggests that people who are more sensitive to nutrition, environment and healthiness are more likely to accept different types of protein alternatives.

Lifestyle represents a significant factor when it comes to understand the potential consumers of plant-based meat alternative products. Many studies noted the relevance of dietary patterns (current meat and meat alternative consumption): consumers with high levels of meat consumption are more receptive to cultured meat (Circus & Robinson, 2019) and products that look similar to meat (Hoek et al., 2011), whereas they are less open to plant-based proteins (lentils: de Boer et al., 2013; meat substitutes: Siegrist & Hartmann, 2019; algae: Weinrich & Elshiewy, 2019; plant-based meat substitutes: Circus & Robinson, 2019). Cultured meat was, for example, favoured by individuals with high meat attachment; edible insects were not favoured by the low and the high meat-attachment groups; and plant-based substitutes were favoured mostly by the low meat-attachment groups who primarily followed vegan and vegetarian diets (Circus & Robinson, 2019).
Additionally, more general dietary lifestyle patterns influence the acceptance of alternative proteins; for instance, following a green, vegetarian diet or a healthy lifestyle is an important aspect in acceptance of snacks made from lentils, seaweed (de Boer et al., 2013), and insects (green eating behaviour: Grasso et al., 2019).

Table 1 summarises all the studies mentioned before in order to have a clear picture of studies, socio-demographic variables, the fields, the locations and the sample sizes.

Table 1: Studies and socio-demographic variables

Study	Variable	Field	Location	Sample size
Gómez-Luciano et al. (2019)	Gender, age, education level	Cultured meat, insects, plant-based meat	Spain and the Dominican Republic	401 (Dominican Republic: 201, Spain: 200)
Orkusz et al. (2020)	Gender, place of residence, household income, protein sources in one-s diet, food neophobia and others	Insects	Poland	Survey: 464; sensory test: 402
Barton et al. (2020)	Gender, age, income, food neophobia	Insects	(Atlantic) Canada	Survey: 107
Birch et al. (2019a)	Gender, age, education level, annual household income, food neophobia, health consciousness and others	Algae (seaweed)	Australia	521
Birch et al. (2019b)	Gender, age, education level, annual household income, food neophobia, health consciousness and others	Algae (seaweed)	Australia	521
De Boer et al. (2013)	Gender, age, education level, country of residence, community size, meat and fish consumption habits	Legumes, seaweed, hybrid meat	The Netherlands	1083
Grasso et al. (2019)	Gender, age group, education level, country of residence, perceived financial situation, health status and dietary regime	Insects, cultured meat, algae, plant-based meat	UK, Netherlands, Poland, Spain, Finland	1825
Siegrist and Hartmann (2019)	Gender, age, household income, education level, health consciousness, food disgust sensitivity	Meat substitutes	Switzerland	5586
Wilks et al. (2019)	Gender, age, education level, household income, meat consumption, political conservatism and others	Cultured meat	Unites States	1193
Rumpold and Langen (2019)	Gender, age, education level, open-mindedness towards novelty, previous insect consumption, cultural background, diet and others	Insects	Germany	149
Van Loo E. J. Et al. (2020)	Gender, age, education level, income, ethnicity, diet and others	Farm-raised meat, lab-grown meat and plant-based meat alternatives	United States	1830
Ciecatiello et al. (2016)	Gender, age, education level, animal protein most often consumed	Insects	Italy	201

Study	Variable	Field	Location	Sample size
Lammers et al. (2019)	Gender, age, education level, meat consumption	Insects	Germany	518
Laureati et al. (2016)	Gender, age, education level, income, food neophobia, sustainable behaviour, place of residence/cultural background	Insects	Italy	341 (68 in the experiment)
Schäufele et al. (2019)	Gender, age, education level, meat consumption and others	Insects	Germany	342
Sogari, Menozzi, and Mora (2019)	Gender, age, region of origin, food neophobia, previous insect consumption and others	Insects	Italy	88
Woolf et al. (2019)	Gender, age, education level, annual income, ethnicity, occupation, place of residence and others	Insects	United States	397
Melendrez-Ruiz et al. (2019)	Gender, age, education level, household composition, view and attitudes towards pulses	Pulses, plant-based meat	France	120
Wim de Koning et al. (2020)	Gender, age, attitudes towards new food and towards new food technologies, healthiness of food, environmental consciousness	Plant and insect-based proteins	China, USA, France, UK, New Zealand, Netherlands, Brazil, Spain, and the Dominican Republic	2091 (China 571, USA 539, France 484, UK 366, New Zealand 268, Netherlands 231, Brazil 216, Spain 210, Dominican Republic 206)
Hoek et al. (2011)	Food choice motives, attitudes, beliefs, food neophobia	Meat substitutes; pulses, cereal or fungi	The Netherlands and United Kingdom	553
Circus and Robinson (2019)	Specific personal drivers, personal barriers, global drivers and global barriers for cultured meat, insects and plant-based substitutes; meat consumption habits	Cultured meat, insects, plant-based substitutes	United Kingdom	139
Weinrich and Elshiewy (2019)	Gender, age, education level, household size, shopping responsibility within household, diet, meat consumption habit/ frequency and others	Meat substitutes based on micro-algae	Germany, The Netherlands and France	940 (Germany: 315, Netherlands: 308, France: 315)

2.3. Complex and structured models

To understand the real drivers, beyond the demographic and psychological segmentation, that influence the consumers' behaviour when it comes to choose or to consume regularly plant-based meat alternatives, more complex and structured models are needed. The following models entail the interaction of a broad set of variables and are based on the rational cognitive stream: Theory of Reasoned Action (Ajzen & Fishbein, 1975; 1980), Theory of Planned Behavior (Ajzen, 1991), Norm-activation Model (Schwartz, 1977) and Value-belief-norm Theory (Stern et al., 1999).

The Theory of Reasoned Action (Ajzen & Fishbein, 1975; 1980) has been adopted in many economic studies and is close to the traditional perspective of rational choice. It states that the behaviour of an individual is influenced by his behavioural intentions which means that we do something because we develop the intention to do so. The intentions and the actual behaviours are closely related but do not always correspond. Intentions are also influenced by two main predictors: attitudes and subjective norms. The attitudes represent the general predisposition towards a specific topic based on expectations, while the subjective norm represents the social pressure or what we believe referent individuals or groups expect us to do. Both of them can be negative or positive and sometimes they go in different directions. An example to clarify this theory can be the fact that one person can have positive attitudes towards consuming plant-based meat alternatives products because he/she thinks that this represents an effective way to protect the environment. On the contrary, his/her family might be very sceptic regarding these new types of products thinking that they are not healthy. In this way, the person might perceive that his/her parents are exerting social pressure and expect a given behaviour. These two aspects influence the intentions of the person that will decide which driver is more relevant and, as a consequence, will manifest a certain behaviour.

This theory received two main criticism. First of all, it seems to be an oversimplification, focusing only on two indicators, while usually many variables cannot be reduced to attitudes and social pressure. Secondly, the theory assumes

that individuals are always rational, but it is more realistic to assume that there are both internal and contextual factors that influence the likelihood of conducting a certain behaviour.

In the field of plant-based meat alternatives, there are some studies that have used this theory. For instance, Mousel T. and Tang X. (2016) have studied the behaviour towards the plant-based meat and dairy alternatives market in Sweden. The study combines the existing TRA model with some new approaches to investigate the problem of acceptance of plant-based alternatives. The results of the study show that there is a gap between behavioural intention and behaviour, but they are still closely linked. Moreover, the only consistent socio-demographic factor that was found influential was gender. Then, they found out that attitude influences consumers' intention to buy a certain product. The variables that are contained within the attitude factor are health, taste, environmental consciousness, animal welfare concerns and positive feelings. However, these factors have previously been proven to influence consumers. The researchers also found that subjective norm has a positive influence on behavioural intention and that Swedish consumers are also influenced by their peers. The barriers towards actually buying the meat and dairy replacement products are information and culture, while the drivers towards buying meat and dairy replacements are health, a concern for animal welfare, a concern for the environment, a good taste and getting a good feeling from buying the product. The study highlights that in general, the Swedish people are somewhat aware of the environmental problems of animal farming, vegans more than omnivores. In addition, some people care more about buying local, supporting the Swedish producers and reducing transport costs, rather than buying an analogue product. Moreover, they appreciate the traditional aspect of their food, they like buying from farmers markets or more natural products with fewer preservatives and synthetic additives.

The Theory of Planned Behavior (Ajzen, 1991) extends the previous theory by adding a third indicator influencing behavioural intentions: perceived behavioural control. It represents the perceived difficulty related to the implementation of a given activity. Referring to the previous example, perceived behavioural control implies that a person might not act consistently with his/her attitudes and

subjective norms because he/she thinks that plant-based meat alternative products are difficult to find in supermarkets and restaurants. This theory has become popular in marketing studies and is widely adopted to investigate behaviours in a wide range of domains. However, this theory has also been criticised because of oversimplification focusing only on three behavioural predictors. That is why, other studies have been conducted to complete the original framework, adding anticipated effect (Ajzen & Sheikh, 2013), emotions (Fishbein & Ajzen, 2011), descriptive norms (Donald et al., 2014), and many more.

A research that I want to highlight is represented by "Drivers of plant-based convenience foods consumption: Results of a multicomponent extension of the theory of planned behaviour" by Contini C. et al. (2020). Here, the Theory of Planned Behavior was used to verify how control factors such as cooking skills, product availability, budget, time pressure, and interest in healthy eating can affect the consumption of precooked plant-based foods. The study was conducted in Italy and the sample size corresponds to 600 individuals, 70% of whom consider plant-based convenience foods as a useful means to improve their diet. An important consideration is that in this study "precooked plant-based foods" are intended as dishes that represent a meal course and require minimum preparation before being served at the table, "minimum preparation" is intended as defrosting and/or heating with modest personalisation before consumption; examples are vegetable soups, vegetable-based quiches, and veggie discs. The results of the study show that Subjective Norm proves to be the most important predictor of Intention (0.38), followed by PBC (0.32) and Attitude (0.27). However, overall the three components account for 58,2% of the variance of Intention. Further analysis underlines the role of Market Availability as a predictor not only of Behaviour but also of Intention. The correlation between Market Availability and Intention to consume can be explained with the function of communication/information that the presence of products on sales outlet shelves can have on the consumer. Consumers who have a greater possibility of being exposed to a product can be more stimulated to consume it. Moreover, the study shows that the interest in healthy eating facilitates the intention to consume PPBFs. So, a lower quality perception in terms of naturalness and freshness associated with processed foods does not represent a barrier to the consumption of PPBFs for consumers with a high level of interest in

healthy eating. Regarding the time pressure variable, it does not seem to influence the planning of the type of food one wants to consume.

Figure 1 illustrates a graphical representation of both theories explained before. As already said, they are very similar, Theory of Planned Behaviour is an extension of the Theory of Reasoned Action.

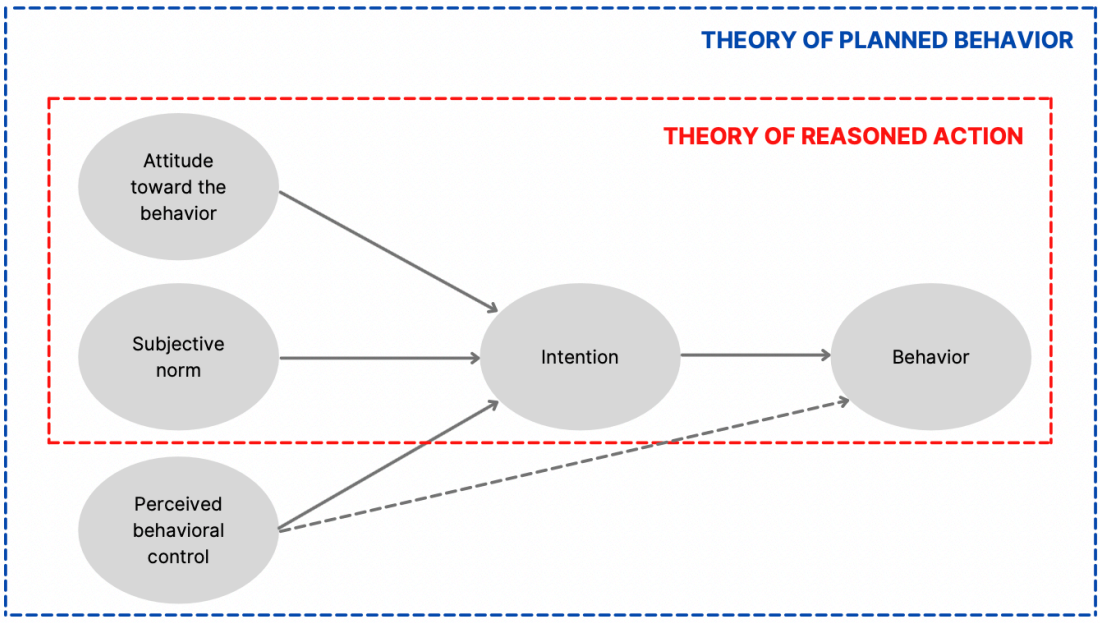

Figure 1: From Theory of Reasoned Action to Theory of Planned Behavior. Source: Adapted from Ajzen (1991).

The Norm-activation Model (Schwartz, 1977) is a theory that was first developed in research on pro-social behaviours but has been later extended to analyse pro-environmental behaviours as well and I think it could be adopted also to analyse the aspects regarding the adoption of a sustainable behaviour when it comes to the consumption of plant-based alternative meat products. This model affirms that personal norms represent the driving force of behaviour. Personal norms are defined as "feelings of moral obligation to perform or refrain from specific actions". So, this means that individuals tend to act responsibly once they are aware of the consequences of their actions on the natural and social environment. Moreover, the theory puts in evidence that two situational variables activate personal norms: problem awareness and ascription of responsibility (see Figure 2). Problem

awareness represents that an individual is aware of the negative consequences of not acting in favour of society/nature, while the ascription of responsibility represents personal feelings of responsibility for such consequences. For instance, an individual might not buy plant-based meat alternatives because he thinks that he is not responsible or he is not the only one responsible for the environmental problem caused by the overconsumption of traditional meat, even if he knows that this behaviour could make a positive impact for the society.

During the years, there have emerged two interpretations regarding this theory. Some scientists affirm that awareness of consequences is an antecedent of the ascription of responsibility, which is an antecedent of personal norms, that influence the behaviours. But, other scientists affirm that awareness of consequences and ascription of responsibility are on the same level and influence at the same time the personal norms on behaviours (DeGroot & Steg, 2009). Borusiak B. et al., (2022) conducted a study in Poland and Slovakia based on this model to identify the predictors of intention to reduce meat consumption due to environmental reasons. In particular, the research model includes variables from the Theory of Planned Behavior (TPB) and the Norm Activation Model (NAM). The two countries that were studied are similar in terms of economic, social, and cultural conditions, located next to each other in the same climate zone, but differ in terms of meat consumption and the direction of its change. In Poland, the meat consumption trend is rising, while in Slovakia it is declining. The results of the study show that in Slovakia attitude toward the impact of meat consumption reduction (MCR) on the environment was the strongest predictor of intention to reduce meat consumption due to environmental reasons. While personal norms were found to be the second statistically significant predictor of the intention to reduce meat consumption due to environmental reasons. In Poland, the strongest predictor of the intention to reduce meat consumption due to environmental reasons was personal norms, which reflect pro-social motivation. Moreover, the study shows that in both countries there is a strong relationship between awareness of consequences and ascription of responsibility and a very strong relationship between awareness of meat production consequences and personal norms regarding eating meat. At the same time, the results of the study indicate that the relationship between the ascription of responsibility and personal norms

regarding MCR is not statistically significant in Slovakia and very low (however significant) in Poland. So, in both countries, personal norm regarding MCR is not predicted by the ascription of responsibility for the environment. The explanation of that fact is not easy as in numerous studies on pro-environmental behaviour the feeling of responsibility turned out to be a strong predictor of eco-friendly behaviour intention. In this study neither the sense of responsibility had an impact on personal norms nor did the social norms influence the intention to reduce meat consumption; therefore, additional studies performed on a different sample and in a different context are needed.

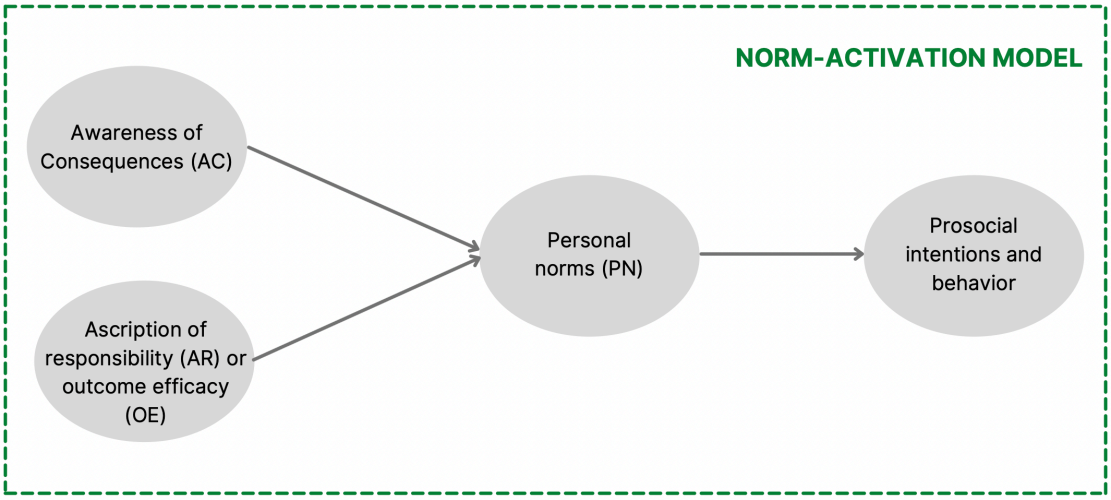

Figure 2: From Theory of Norm-activation Model.
Source: Adapted from Schwartz (1997).

Another model is represented by the Value-belief-norm Theory (Stern et al., 1999). It consists of a casual chain of five variables, as each variable influences the next on the chain and are represented by: values, the new ecological paradigm (NEP), beliefs about the impacts of conduct on the environment, the ascription of responsibility, and personal norms (see Figure 3). This theory is similar to the previous one as they have in common the aspect of the ascription of responsibility and the aspect of the personal norms, however, there are other new notions. First of all, the values are defined as concepts "pertain to desirable end-states that transcend specific situations, guiding the selection and evaluation of behaviours" (Schwartz & Bilsky, 1990: 878). This means that they are broader and more stable

compared to the attitudes (beliefs about specific behaviours and objects). Then, the new ecological paradigm (NEP) (Dunlap & Van Liere, 1978; Dunlap et al., 2000) is a scale that has been developed to assess the environmental world view of individuals and populations. It consists of fifteen statements (or items) on which respondents are asked to express agreement adopting a Likert scale.

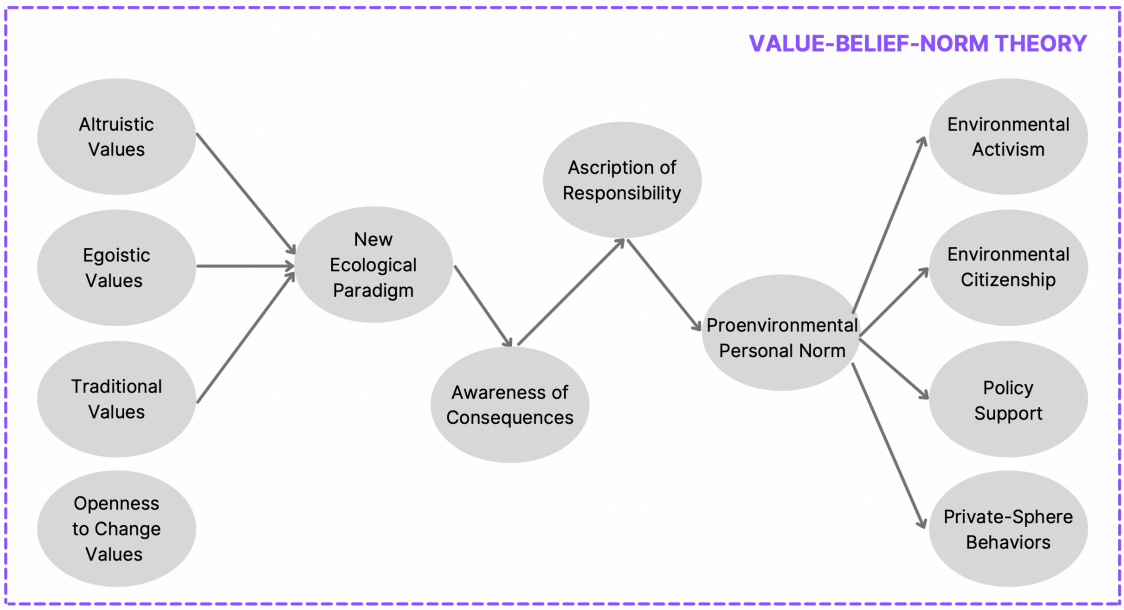

Figure 3: From Theory of Value-belief-norm.
Source: Adapted from Stern et al. (1999).

A study conducted by Carfora V. et al., (2020) applied the Theory of Value-belief norm (VBN) and the Theory of Planned Behavior (TPB) to analyse the psychosocial aspects that predict intention to reduce red/processed meat consumption. The study was conducted in Italy and there have participated 233 individuals in the survey. The results show that the combined model of the two models is more effective than the classic TPB or VBN model because they are designed to capture different aspects of a person's intention. The TPB model is meant to capture motives related to individual cost-benefit analyses, while the VBN focuses more on moral motives. The results showed that participants' intention to reduce red/ processed meat consumption is strongly associated with rational consideration of benefits related to the behaviour in question, which in turn is based on moral considerations connected to pro-environmental motives. So, rational motives such as attitude and subjective norm are the best predictors of the intention to choose

organic menu items, compared to pro-environmental motives. The attitude was the strongest predictor and this was partly explained by both the awareness of the environmental consequences of excessive meat consumption and the personal norm to reduce it. Subjective norm is also an important predictor of the intention to reduce the consumption of red meat. But, previous studies conducted in Italy had not found a significant connection between the perception of a social pressure to reduce red meat consumption and the intention to reduce it. These different findings might be due to the increasing awareness of the negative impacts of traditional meat on the environment, suggesting that the reduction in the consumption of red meat is becoming a social trend in Italy. Moreover, the study showed that participants feel a moral obligation to protect the environment from the damages associated with excessive red meat consumption (i.e., the ascription of responsibility) when they can control their food choice (i.e., perceived behavioural control). This shows that personal responsibility is perceived or attributed to others when an outcome is considered controllable. That is why, public policy should stress the presence of alternative food choices that can substitute the nutritious values of meat, as well as should allow people to have easier access to more plant-based food. In addition, results showed a low relationship between the awareness of the environmental consequences of excessive red meat consumption and participants' attitude toward reducing red meat consumption. This low direct effect may be due to the fact that attitude has also affective and cognitive dimensions, which were not addressed in this study.

2.4. Habits and other models

All the models explained previously are based on a rationalistic perspective entailing that behaviour is the result of an elaborated process, but sometimes people automatically perform an activity because they developed some habits. The role of habits is very important in research about plant-based meat alternative products because many people got used to buying and preparing traditional meat. Many people buy from the same grocery shops, the same products, spending the same amount of money every day/week/month. This happens as a result of the

tendency to reduce the effort of taking always decisions and once people identify a routine that fulfils their needs in a specific period, they will tend to follow this routine for a prolonged period until the context changes.

Habits are "a form of goal-directed behaviour. They are represented as links between a goal and actions that are instrumental in attaining this goal. The strength of such a link is dependent on frequent co-activation of the goal and the relevant action in the past. The more often the activation of a goal leads to the performance of the same action under the same circumstances, the stronger the habit" (Aarts & Dijksterhuis, 2000). Another definition says that habits are "repeated behaviors that have become automatic responses in recurrent and stable contexts" (Verplanken, 2011). From these definitions we can affirm, there are three elements that characterise a genuine habit: frequency of past behaviour, stability of the context and automaticity.

Habits represent a problem when it comes to marketing strategies because the individuals do not seek nor process the information they see or receive. High investments in marketing can be useless when individuals are following routine activities.

To measure habits, there have been developed two scales. One of them is The Self-Reported Habit Index (Verplanken & Orbell, 2003) and the respondents are asked to evaluate on a Likert scale their agreement with a battery of twelve statements regarding a specific behaviour focusing on automaticity, repetition and identity. Table 2 represent the index with a specific reference to the case of consuming traditional meat.

Table 2: Self-Reported Habit Index (Verplanken & Orbell, 2003)

Consuming traditional meat is something:	(Likert scale)
I do frequently	
I do automatically	
I do without having to consciously remember	
That makes me feel weird if I do not do it	
I do without thinking	

Consuming traditional meat is something:	(Likert scale)
That would require effort not to do it	
That belongs to my (daily, weekly, monthly) routine	
I start doing before I realise I'm doing it	
I would find hard not to do	
I have no need to think about doing	
That's typically me	
I have been doing for a long time	

It has been demonstrated that there are individuals who are more inclined towards routines and habitual behaviours compared to others depending on personalities. The second approach to measure habits is represented by Oreg Resistance to Change Scale (2003). Compared to SRHI, it evaluates the general predisposition to change of a given individual and focuses on broad and overarching traits of personality rather than on specific activities and behaviours. The individual should express the level of agreement to 17 sentences using a Likert scale. Table 3 represents the Resistance to Change Scale that can be adopted in research on consumer behaviour.

An interesting point is that there is a correlation between how individuals score on the Resistance to Change Scale and the Self Reported Habit Index scale. An individual that is generally averse to change will be more likely to develop routines and habitual behavioural patterns in many domains. However, this might not be always the case.

Table 3: Oreg Resistance to Change Scale (2003)

Routine seeking	• I generally consider changes to be a negative thing • I'll take a routine day over a day full of unexpected events any time • I like to do the same old things rather than try new and different ones • Whenever my life forms a stable routine, I look for ways to change it • I'd rather be bored than surprised

Emotional reaction	• If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed • When things don't go according to plans, it stresses me out When I am informed of a change of plans, I tense up a bit • If my boss changed the criteria for evaluating employees, it would probably make me feel uncomfortable even if I thought I'd do just as well without having to do any extra work
Short-term thinking	• Changing plans seems like a real hassle to me • When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me • I sometimes find myself avoiding changes that I know will be good for me • Once I've made plans, I'm not likely to change them
Cognitive rigidity	• Once I've come to a conclusion, I'm not likely to change my mind • I often change my mind • My views are very consistent over time • I don't change my mind easily

Many models have been reviewed by integrating the concept of habits into the rationalistic perspective. But, there have been also developed new models: The Attitude-Behavior-Context (ABC) Model (Guagnano et al. 1995, Stern 2000) and The Comprehensive Action Determination Model (Klöckner & Blöbaum 2010). First of all, Fishbein and Ajzen themselves admit that habits are a potential mediator of intentions; however, they attribute habits a minor role. Ajzen (1991) recognises that past behaviour, once it develops into a genuine habit, has the potential to affect later behaviour.

Then, Ronis et al. (1989) framed a theory of repeated behaviour suggesting that the influence of habits on behaviours is independent of intentions, and repeated behaviours may be largely determined by habits rather than by attitudinal variables, although attitudes are central to the formation and modification of habits.

Moreover, Triandis (1977, 1980) developed the theory of interpersonal behaviour that consists of the interaction between intentions and habits to predict behaviours. It is very similar to the theory of planned behaviour, however, the interpersonal behaviour theory states that consciousness decreases as the strength of habit in performing the behaviour increases. At this point, the model represents

a link that connects rational models and frameworks based on automatic responses to recognised situations. It argues that when an activity is performed frequently, habit strength increases and as a consequence, behaviour is no longer guided by intentions. When an individual develops strong habits, his decision process ceases to exist or significantly decreases and the activities he performs are done automatically.

The Attitude-Behavior-Context (ABC) model (Guagnano et al. 1995, Stern 2000) is based on four variables that influence consumer behaviour: attitudinal factors (values, norms), contextual forces (incentives, external influences), personal capabilities (skills), and habits.

Stern (2000) clarifies the four variables in his study "Theory of Environmentally Significant Behavior". The attitudinal factors include norms, beliefs and values. The general predisposition to act with pro-environmental intent can influence all behaviours an individual considers to be environmentally important. Other attitudinal variables affect only certain environmentally relevant behaviours: behaviour-specific predisposition (specific personal moral norms) and behaviour-specific beliefs (about the difficulty of taking certain actions or about their consequences for self, others, or the environment). Stern also indicates that environmentally significant behaviour can also be affected by non-environmental attitudes, such as those about attributes of consumer products that are correlated with environmental impact (speed, power, and luggage capacity in motor vehicles), or about luxury and waste, or the importance of spending time with the family.

The second type of causal variable is external or called also contextual forces. These include interpersonal influences (persuasion, modelling); community expectations; advertising; government regulations; other legal and institutional factors; monetary incentives and costs; the physical difficulty of specific actions; capabilities and constraints provided by technology and the built environment (for example, building design, solar energy technology), the availability of public policies to support behaviour (for example, curbside recycling programs); and various features of the broad social, economic and political context (for example, the price of oil or interest rates in financial markets).

Personal capabilities represent the third type of causal variable. These include the knowledge and skills required for particular actions (for instance: mechanical knowledge for energy-conserving home repairs), the availability of time to act, and general capabilities and resources such as literacy, money, and social status and power. Sociodemographic variables such as age, educational attainment, race and income may be indicators for personal capabilities.

The last causal variable is represented by habit or routine. Behavioural change often requires breaking old habits and becomes established by creating new ones. Stern highlights that habit, in the form of standard operating procedure, is also a key factor in environmentally significant organisational behaviour.

Moreover, this model assumes that there is a contrast between attitudinal and contextual factors and that stronger impacts of contextual factors will lead to weaker attitude-behaviour link and vice versa. Furthermore, according to the specificity of the case object of analysis, the relevance of each variable can change: for instance, travel mode choice is influenced more by habits, while green purchasing is mainly influenced by factors such as knowledge or skills, and what about plant-based meat products consumption? In the next chapters, I will answer this question by identifying which of these four variables is more relevant.

Although the ABC model is widely used to study the environmental behaviour of individuals, an important consideration is the fact that to the knowledge of the authors, there are no studies that have been applied this model to analyse the consumer's behaviour towards plant-based meat alternatives.

The Comprehensive Action Determination Model (Klöckner & Blöbaum, 2010) consists in the integration of different approaches since behaviour can be influenced by intentional, habitual and situational sources. According to the model, intentional and habitual determinants can be in turn influenced by normative processes such as social or norms. Like the previous model, there are no studies that have been applied the Comprehensive Action Determination Model in the field of plant-based meat substitute products.

All the models presented can be applied to study the consumer's behaviour in the field of plant-based meat alternatives, even if they have not been invented to

analyse specifically this field. For instance, the theory of reasoned action and the theory of planned behaviour are born out of environmental research. However, these theories were adopted in a variety of fields. Moreover, the concept of habits is fundamental to understand the consumer's behaviour because many people are following routines when it comes to food, and respectively, they are not open to new information, new types of food, new ways of preparation and other factors.

To disrupt the habits, marketing strategists should be aware of the Habit Discontinuity Hypothesis (Verplanken et al. 2008). It states that "behaviour change interventions may thus be more effective when delivered in the context of major habit disruptions, such as those related to life course changes". This happens because, on such occasions, individuals are more willing to search for further information about alternative courses of action, and are more open to making changes. When a routine is disrupted, individuals are somehow forced to reconsider the way they do things and are willing to search for information about alternative opportunities. Moreover, disruptions and context changes, at the same time, have relevant impacts also on people's values, attitudes and beliefs, making them more salient and people more attentive to them (Lanzini, 2018).

Chapter 3. Consumers' behaviour and survey

3.1. Model and hypotheses

The aim of the study is to understand the Italian consumer behaviour towards plant-based meat and identify the driving factors and the barriers that influence the Italian consumers when it comes to buy and consume these specific products. That is why, in the previous chapters, it has been conducted a general analysis of the existing studies: researches conducted in different countries, studying different meat alternative proteins and using different methods. These studies are at the base of understanding the main driving factors and the barriers. However, it is interesting to focus and conduct the research only in Italy concentrating only on plant-based meat alternative products.

The goal is to find out what motivates customers to buy plant-based meat alternatives and what barriers prevent consumers from buying these products. I decided to use a complex model that takes into consideration the rationalistic perspective of the consumers, but also their habits. That is why I chose the Attitude-Behavior-Context (ABC) Model (Guagnano et al. 1995, Stern 2000). Another reason is represented by the fact that, to the author's knowledge, there are no studies that applied the ABC model to analyse the consumer's behaviour towards plant-based meat alternative products. This aspect renders my study important and could be crucial for other studies in this field. I developed the questionnaire based on the four components of the model: attitudinal factors, contextual forces, personal capabilities and habits. I want to understand whether all of these factors are relevant, and eventually, which one is the most important. So, I stated the following hypotheses:

H1: Consumers' attitudinal factors (values, beliefs, norms) towards plant-based meat alternatives have a positive and significant relationship to their behaviour of consuming these products.

H2: Consumers' personal capabilities towards plant-based meat alternatives have a positive and significant relationship to their behaviour of consuming these products.

H3: Consumers' contextual forces towards plant-based meat alternatives have a positive and significant relationship to their behaviour of consuming these products.

H1, H2 and H3 can be expressed with **Equation 1**:

$$B = B_1A + B_2PC + B_3C$$

Where:

- B is the specific behaviour of consuming plant-based meat alternatives;
- A represents the attitudes towards plant-based meat alternatives;
- PC represents the personal capabilities towards plant-based meat alternatives;
- C represents the contextual forces associated with plant-based meat alternatives;
- B_1, B_2, B_3 are the weights associated with attitudes, personal capabilities and contextual forces.

Referring to habits, I want to analyse whether the general predisposition to change of Italians is influencing positively or negatively their behaviour of consuming plant-based meat products. That is why I stated hypothesis 4 and the original equation changed into Equation 2. In addition, it is interesting to observe how the weights of the other variables change.

H4: Italian's resistance to change score has a negative and significant relationship towards the consumption of plant-based meat alternative products.

Equation 2:

$$B = B_1A + B_2PC + B_3C + B_4Hr$$

Where:

- B is the specific behaviour of consuming plant-based meat alternatives;

- A, PC, C represent the attitudes, personal capabilities and contextual forces towards plant-based meat alternatives;
- Hr represents the resistance to change score;
- B_1, B_2, B_3, B_4 are the weights associated with attitudes, personal capabilities, contextual forces and resistance to change score.

Moreover, the habit of buying traditional meat could be a barrier that prevents consumers from trying new types of food. So, I stated hypothesis 5 and Equation 3.

H5: A consumer's habit of buying traditional meat has a negative and significant relationship towards its behaviour of consuming plant-based meat alternatives.

Equation 3:

$$B = B_1A + B_2PC + B_3C + B_5Hs$$

Where:

- B is the specific behaviour of consuming plant-based meat alternatives;
- A, PC, C represent the attitudes, personal capabilities and contextual forces towards plant-based meat alternatives;
- Hs represents the self-reported habit index related to the habit of buying PBMA products;
- B_1, B_2, B_3, B_4, B_5 are the weights associated with attitudes, personal capabilities, contextual forces and self-reported habit index associated with the habit of buying PBMA products.

Furthermore, since many researchers believe socio-demographic variables are important, I want to test whether these variables influence also the behaviour towards plant-based meat alternatives:

H6: A person's socio-demographic background (age, gender and living situation) influences significantly the behaviour to consume plant-based meat alternative products.

To incorporate hypothesis 6 into the existing model, I came up with a new equation, **Equation 4**:

$$B = B_1A + B_2PC + B_3C + B_5Hs + B_6Gender1 + B_7Gender2 + B_8Gender3 + B_9Age1 + B_{10}Age2 + B_{11}Age3 + B_{12}Age4 + B_{13}Age5 + B_{14}Age6 + B_{15}LS1 + B_{16}LS2 + B_{17}LS3 + B_{18}LS4 + B_{19}LS5$$

Where:

- B is the specific behaviour of consuming plant-based meat alternatives;
- A, PC, C represent the attitudes, personal capabilities and contextual forces towards plant-based meat alternatives;
- Hs represents the self reported habit index associated to the habit of buying of PBMA products;
- B_1, B_2, B_3, B_5 are the weights associated to attitudes, personal capabilities, contextual forces and self reported habit index related to the habit of buying of PBMA products;
- Gender1 = Dummy variable 1 of Gender (Gender1=1 if male, 0 otherwise);
- Gender2 = Dummy variable 2 of Gender (Gender2=1 if other, 0 otherwise);
- Gender3 = Dummy variable 3 of Gender (Gender3=1 if prefer not to answer, 0 otherwise);
- Age1 = Dummy variable 1 of Age (Age1=1 if up to 16, 0 otherwise);
- Age2 = Dummy variable 2 of Age (Age2=1 if 17-20, 0 otherwise);
- Age3 = Dummy variable 3 of Age (Age3=1 if 26-30, 0 otherwise);
- Age4 = Dummy variable 4 of Age (Age4=1 if 31-40, 0 otherwise);
- Age5 = Dummy variable 5 of Age (Age5=1 if 41-60, 0 otherwise);
- Age5 = Dummy variable 6 of Age (Age6=1 if more than 60, 0 otherwise);
- LS1 = Dummy variable 1 of Living Situation (LS1=1 if alone, 0 otherwise);
- LS2 = Dummy variable 2 of Living Situation (LS2=1 if with partner, 0 otherwise);
- LS3 = Dummy variable 3 of Living Situation (LS3=1 if with partner and children, 0 otherwise);
- LS4 = Dummy variable 4 of Living Situation (LS4=1 if single parent, 0 otherwise);
- LS5 = Dummy variable 5 of Living Situation (LS5=1 if with roommates, 0 otherwise);

- B_6 - B_{19} = Weights reflecting the relative influence each dummy variable has on the behaviour of consuming PBMA.

The different variables that are determined for Gender, Age and LS (living situation) are called dummy variables. A dummy variable is a binary variable that can take only two values, 0 and 1. It is often used in the regression model to incorporate qualitative (categorical) explanatory variables.

Focusing on the barriers that could prevent consumers from consuming plant-based meat alternatives, it is important to highlight the following barriers: cultural, information, price, taste, the difficulty of preparation and food neophobia. On the other hand, there are some concerns associated with traditional meat that influence consumers to buy plant-based meat alternative products. As seen in the previous studies they are principally environmental, health and animal suffering concerns. So, I stated the following hypotheses:

H7: The cultural barrier (CB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H8: The information barrier (IB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H9: The price barrier (PB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H10: The taste barrier (TB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H11: The preparation difficulty barrier (PDB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H12: The food neophobia barrier (FNB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H13: The environmental concerns (EC) associated with animal farming have a positive and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H14: The health concerns (HC) associated with the consumption of traditional meat have a positive and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

H15: The animal suffering concerns (ASC) associated with meat consumption have a positive and significant impact on the consumer's behaviour of consuming plant-based meat alternatives.

To test the hypotheses from H7 to H15, I stated **Equation 5**:

$$B = B_1CB + B_2IB + B_3PB + B_4TB + B_5PDB + B_6FNB + B_7EC + B_8HC + B_9ASC$$

Where:

- B is the specific behaviour of consuming plant-based meat alternatives;
- CB, IB, PB, TB, PDB and FNB correspond to cultural, information, price, taste, preparation difficulty and food neophobia barrier;
- EC, HC and ASC correspond to environmental, health and animal suffering concerns;
- B_1 to B_9 are the weights associated with respective barriers and concerns.

3.2. Research method and questionnaire

To reach the objectives, I decided to conduct primary quantitative research by collecting "fresh" data, gathered through a survey. Moreover, I decided to focus on a single point in time to examine the relationship between variables and that is why I conducted a cross-sectional study. In addition, I decided to conduct the survey online because of the benefits that offer this method, such as low cost, self-

selection response rate, excellent geographic flexibility, no interviewer bias, no interviewer supervision and excellent quality of response. I tried to formulate the questions clearly and comprehensively avoiding long questions, avoiding ambiguousness and without invading the privacy of respondents. The questions are simple, straightforward and specific. The question format that I used is close-ended questions because of the advantage of analysing the results using a statistical program. In addition, the majority of questions imply responding by using Likert scales from 1 to 5 where respondents are asked to agree or disagree with a statement. Likert scales are easy to prepare and interpret, are simple for the respondents and give more information than yes/no response.

The questionnaire was first written in English, then translated and distributed in the Italian language. The web application that was used for the creation of the questionnaire and the collection of the results is Google Form (or Google Module).
As it was not possible to survey the entire Italian population on the subject, a sample was necessary. In this way, I decided to put the questionnaire online to get my friends, family and colleagues living in Italy to answer it, but as the responses were not enough I went also to public places, such as social media groups, and asked people (in the majority of cases: other students from different universities) to participate. As a result, the type of sample that was used is a combination of self-selection sampling (Saunders M. et al., 2009) for people who decided to take the online questionnaire; snowball sampling (Saunders M. et al., 2009) because I asked my friends to forward the questionnaire to their friends; and convenience sampling (Saunders M. et al., 2009) as I involved respondents that are easiest to fill out the survey (family, friends).
After the collection of the results, Google Form enables to download all the data in the format of an excel file that is compatible with the statistical program SPSS Statistics (used for the analysis of the results).

In the solicitation message and before the actual survey I considered it necessary to explain in two or three sentences what are the plant-based meat alternatives and that they should not be confused with other vegan or vegetarian products. Moreover, I described the purpose of the survey and mentioned its length, being

already pretested on other persons. In addition, I ensured respondents that the responses are confidential and anonymous and that the survey is voluntary. I also provided contact information in case participants have questions about the survey and I set the date when the survey closes.

The questionnaire has 22 questions, but some of them have other subquestions. In general, the questionnaire can be divided into social demographic questions and questions related to Attitude-Behavior-Context Model variables. Regarding the habit variables, there are also questions from the Oreg scale and some questions including the Self-Reported-Habit scale (Table 4 contains the full questionnaire in the English version).

Table 4 : Questionnaire in English version

Number	Question	Response options
Question 1	Your diet is mainly: (Only one possible answer)	◉ Omnivorous ◉ Carnivorous ◉ Vegetarian ◉ Vegan ◉ Other...
Question 2	How often have you heard about plant-based meat alternatives) ?	Likert scale from 1 to 5 (From "never" to "very often")
Question 3	Have you ever tried plant-based meat alternatives? (Only one possible answer)	◉ Yes ◉ No
Question 4	How often do you consume traditional meat in an average month?	Likert scale from 1 to 5 (From "never" to "every day")
Question 5	How often do you consume plant-based meat alternatives in an average month?	Likert scale from 1 to 5 (From "never" to "every day")
Question 6	How often do you think you will consume plant-based meat alternatives in the future?	Likert scale from 1 to 5 (From "never" to "every day")
Question 7	How harmful do you think animal farming is to the environment?	Likert scale from 1 to 5 (From "not at all" to "very much")
Question 8	How harmful do you think meat is to your health?	Likert scale from 1 to 5 (From "not at all" to "very much")

Number	Question	Response options
Question 9	Estimate the following sentences:	Likert scale from 1 to 5 for every subquestion (1-“strongly disagree”; 2 -“disagree”; 3 -“don’t know”; 4 -“agree”; 5 -“strongly agree”)
9.1	I didn’t know about the existence of the plant-based meat alternatives;	
9.2	I don’t know where to find plant-based meat alternatives;	
9.3	I don’t know very much about plant-based meat alternatives;	
9.4	I don’t know how to cook plant-based meat alternative;	
9.5	Plant-based meat alternatives are tasty;	
9.6	Plant-based meat alternatives are too expensive;	
9.7	Plant-based meat alternatives are easy to cook;	
9.8	Plant-based meat alternatives are sustainable;	
9.9	Plant-based meat alternatives are healthy;	
9.10	If plant-based meat alternatives were less costly than traditional meat, I would buy them for sure;	
9.11	I feel good with myself when I consume plant-based meat;	
9.12	The consumption of plant-based meat alternatives at a global level would improve the animal lives;	
9.13	It is hard to find information about plant-based meat alternatives;	
9.14	I live with other people and I can’t freely decide what to consume;	
9.15	I don’t like trying new types of food;	
9.16	I value cultural and traditional aspect of food.	
Question 10	Estimate the appropriateness of eating plant-based meat alternatives in the following occasions:	Likert scale from 1 to 5 for every subquestion (1-“not appropriate at all”; 2 -“not appropriate”; 3 -“indifferent”; 4 -“appropriate”; 5 -“very appropriate”)
10.1	You are eating alone;	
10.2	You are invited to eat with friends;	
10.3	You are eating with your family on a weekday;	
10.4	You are eating Sunday dinner with your family;	
10.5	You are invited for dinner in a restaurant;	
10.6	You are at a business meal.	
Question 11	Estimate the following sentences:	Likert scale from 1 to 5 for every subquestion (1-“strongly disagree”; 2 -“disagree”; 3 -“don’t know”; 4 -“agree”; 5 -“strongly agree”)
11.1	My friends think I should consume plant-based meat alternatives;	
11.2	What my friends think about my consumption is important to me;	
11.3	My family think I should consume plant-based meat alternatives;	
11.4	What my family think about my consumption is important to me;	
11.5	My colleagues/classmates think I should consume plant-based meat alternatives;	
11.6	What my colleagues/classmates think about my consumption is important to me.	

Number	Question	Response options
Question 12 12.1 12.2 12.3 12.4	Estimate the following sentences: I like to do the same old things rather than try new and different ones; If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed; I sometimes find myself avoiding changes that I know will be good for me; I don't change my mind easily.	Likert scale from 1 to 5 for every subquestion (1-"strongly disagree"; 2 -"disagree"; 3 -"don't know"; 4 -"agree"; 5 -"strongly agree")
Question 13 13.1 13.2 13.3 13.4 13.5 13.6 13.7 13.8 13.9 13.10 13.11 13.12	Consuming traditional meat is something: I do frequently; I do automatically; I do without having to consciously remember; That makes me feel weird if I do not do it; I do without thinking; That would require effort not to do it; That belongs to my (daily, weekly, monthly) routine; I start doing before I realise I'm doing it; I would find hard not to do; I have no need to think about doing; That's typically me; I have been doing for a long time.	Likert scale from 1 to 5 for every subquestion (1-"strongly disagree"; 2 -"disagree"; 3 -"don't know"; 4 -"agree"; 5 -"strongly agree")
Question 14 14.1 14.2 14.3 14.4 14.5 14.6 14.7 14.8 14.9 14.10 14.11 14.12	Buying traditional meat is something: I do frequently; I do automatically; I do without having to consciously remember; That makes me feel weird if I do not do it; I do without thinking; That would require effort not to do it; That belongs to my (daily, weekly, monthly) routine; I start doing before I realise I'm doing it; I would find hard not to do; I have no need to think about doing; That's typically me; I have been doing for a long time.	Likert scale from 1 to 5 for every subquestion (1-"strongly disagree"; 2 -"disagree"; 3 -"don't know"; 4 -"agree"; 5 -"strongly agree")
Question 15	Are you currently living in Italy? (Only one possible answer)	◉ Yes ◉ No
Question 16	Gender: (Only one possible answer)	◉ Female ◉ Male ◉ Other ◉ I prefer not to answer
Question 17	Age: (Only one possible answer)	◉ Up to 16 ◉ From 17 to 20 ◉ From 21 to 25 ◉ From 26 to 30 ◉ From 31 to 40 ◉ From 41 to 60 ◉ More than 60

Number	Question	Response options
Question 18	Occupation? (Only one possible answer)	◉ Student ◉ Working ◉ Unemployed ◉ Retired ◉ Other…
Question 19	Living situation: (Only one possible answer)	◉ Alone ◉ With parter ◉ With partner and children ◉ Single parent ◉ With parents ◉ With roommate(s)
Question 20	Education: (Only one possible answer)	◉ Secondary school diploma ◉ Bachelor ◉ Masters ◉ PhD ◉ I prefer not to answer
Question 21	What is your personal monthly income? (Only one possible answer)	◉ I don't have my own income ◉ From 500 to 1000 euros ◉ From 1000 to 2000 euros ◉ From 2000 to 3000 euros ◉ From 3000 to 4000 euros ◉ More than 4000 euros
Question 22	How much do you spend on a weekly average for the food only for yourself including restaurant and fast foods? (Only one possible answer)	◉ I don't have personal expenses ◉ Up to 50 euros ◉ From 50 to 100 euros ◉ From 100 to 200 euros ◉ From 300 to 400 euros ◉ From 400 to 500 euros ◉ More than 500 euros

Social demographic questions correspond to the questions about whether the respondents live in Italy (question 15), the respondent's gender (question 16), age (question 17), occupation (question 18), living situation (question 19), education (question 20) and monthly income (question 21). Moreover, it is interesting to discover how much Italians spend weekly on food, including eating in restaurants (question 22). Also, the question about the living situation (question 19) is important because often individuals are influenced by the decisions and habits of the people with who they live (parents, roommates, partners), and respectively, they do not make purchase decisions on their own. Another important question is connected to the respondents' diet (question 1). From the answers, it can be deducted the lifestyle and the values of the respondents. I decided to position the majority of these questions at the end of the questionnaire because these are easy questions and do not require much effort to answer. To maintain respondents

engaged till the end of the questionnaire, I wanted to start the questionnaire with easy questions, then the most difficult questions I positioned in the middle and I finished with other easy questions.

Regarding the Attitude-Behavior-Context Model, the questions are related to the model's variables: attitudes, contextual forces, personal capabilities and habits. For instance, to analyse attitudes, I introduced questions about how often the respondents think they will consume plant-based meat alternatives in the future (question 6), about how they perceive the taste (question 9.5), easiness to cook (question 9.7), sustainability (question 9.8), healthiness (question 9.9), feelings (question 9.11) and impact on the animals' lives (question 9.12) associated to the consumption of plant-based meat alternatives.

To analyse the second variable, the personal capabilities of respondents, I asked them to evaluate some sentences, such as whether they knew about the existence of plant-based meat products before this survey (question 9.1), also if they know where to find these products (question 9.2), how much they know in general about these products (question 9.3), how to cook them (question 9.4), and whether these products are too expensive (question 9.6).

The contextual forces can be analysed through the questions about whether the respondents' family, friends, colleagues, think they should consume plant-based meat (questions 11.1, 11.3, 11.5). Moreover, it can be useful to analyse the contextual factors also by asking respondents to evaluate the appropriateness to eat plant-based meat alternatives in different situations, such as eating alone, with friends, with family on a weekday, with family on Sunday, invited for dinner in a restaurant, and at a business meal (questions 10.1, 10.2, 10.3, 10.4, 10.5, 10.6).

To study habits, I inserted four questions from the Oreg scale to analyse the general predisposition to change of Italians through routine seeking aspect (question 12.1), emotional reaction aspect (question 12.2), short-term thinking aspect (question 12.3) and cognitive rigidity aspect (question 12.4). Furthermore, I also inserted two sets of questions to study two specific behaviours focusing on automaticity, repetition and identity using the Self-Reported-Habit scale: consuming traditional meat (questions 13.1-13.12) and buying traditional meat

(question 14.1-14.12). I want to study what are the differences between these two questions, whether it is a gap, and how strong are these habits.

Table 5 summarises the ABC Model variables associated with questions from the questionnaire in order to have a clear view of the various categories. This table will also be useful in the analysis part (chapter 4).

Table 5: ABC Model variables and questions

Variable	Question number	Question
Attitudinal factors	Question 6	How often do you think you will consume plant-based meat alternatives in the future?
	Question 9.5	Plant-based meat alternatives are tasty;
	Question 9.7	Plant-based meat alternatives are easy to cook;
	Question 9.8	Plant-based meat alternatives are sustainable;
	Question 9.9	Plant-based meat alternatives are healthy;
	Question 9.11	I feel good with myself when I consume plant-based meat;
	Question 9.12	It is hard to find information about plant-based meat alternatives;
Personal capabilities	Question 9.1	I didn't know about the existence of the plant-based meat alternatives;
	Question 9.2	I don't know where to find plant-based meat alternatives;
	Question 9.3	I don't know very much about plant-based meat alternatives;
	Question 9.4	I don't know how to cook plant-based meat alternative;
	Question 9.6	Plant-based meat alternatives are too expensive;
Contextual forces	Question 10.1	You are eating alone;
	Question 10.2	You are invited to eat with friends;
	Question 10.3	You are eating with your family on a weekday;
	Question 10.4	You are eating Sunday dinner with your family;
	Question 10.5	You are invited for dinner in a restaurant;
	Question 10.6	You are at a business meal;
	Question 11.1	My friends think I should consume plant-based meat alternatives;
	Question 11.3	My family think I should consume plant-based meat alternatives;
	Question 11.5	My colleagues/classmates think I should consume plant-based meat alternatives;
	Questions 12.1-12.4 (Oreg scale)	I like to do the same old things rather than try new and different ones; If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed; I sometimes find myself avoiding changes that I know will be good for me; I don't change my mind easily.

Variable	Question number	Question
Habits	Questions 13.1-13.12 (SRHI)	Consuming traditional meat is something: I do frequently; I do automatically; I do without having to consciously remember; That makes me feel weird if I do not do it; I do without thinking; That would require effort not to do it; That belongs to my (daily, weekly, monthly) routine; I start doing before I realise I'm doing it; I would find hard not to do; I have no need to think about doing; That's typically me; I have been doing for a long time.
	Questions 14.1-14.12 (SRHI)	Buying traditional meat is something: I do frequently; I do automatically; I do without having to consciously remember; That makes me feel weird if I do not do it; I do without thinking; That would require effort not to do it; That belongs to my (daily, weekly, monthly) routine; I start doing before I realise I'm doing it; I would find hard not to do; I have no need to think about doing; That's typically me; I have been doing for a long time.

When I imported the data into the SPSS Statistics software, it needed to be transformed. Initially, I assigned each question a measurement scale: "nominal", "ordinal" or "scale". "Nominal" and "ordinal" are used to describe qualitative statistical variables, while "scale" is used for quantitative statistical variables. "Nominal" is a figurative labelling scheme in which the numbers serve only as labels for identifying and classifying objects. "Ordinal" is a ranking scale in which numbers are assigned to objects to indicate the relative extent to which objects possess certain characteristics. "Scale" is referring to interval or ratio scale where numerically equal distances on the scale represent equal values in the characteristic being measured.

To avoid redundancy, some answers of question 18 (about occupation), needed to be transformed: "startupper" and "farmacista" were transformed into "working". In addition, it was created a new occupation category "working student", because it was lacking and the results showed this category is important.

Moreover, for some questions, it was needed to do the reverse scoring, depending on the equation. Reverse scoring needs to be done because sometimes the same group of statements on a single measure is stated in different "directions." That is, sometimes a "5" indicates a high level of endorsement of a particular attitude, whereas, on other items, a "5" means a low level of endorsement of that attitude. Before responses can be combined into a single meaningful total score, all items must be in the same direction. To accomplish this, the scores for those items that are in an opposite direction are "reversed." High scores become low scores and low scores become high scores. Referring to this questionnaire, I did the reverse scoring for all the questions associated with personal capabilities (question 9.1, 9.2, 9.3, 9.4, 9.6) because they were stated in the opposite direction. Moreover, when I approached the hypotheses referring to barriers I reversed the score for questions 9.5 and 9.7.

The statistical tests choices to analyse collected data through SPSS Statistics are:

1. Descriptive statistics of SPSS for the demographic distribution;
2. Reliability analysis of SPSS to test the internal consistency of attitudinal factors, personal capabilities, contextual forces, resistance to change and self-reported habit index;
3. Factor analysis of SPSS to test the construct validity of attitudinal factors, personal capabilities, contextual forces, resistance to change and self-reported habit index;
4. Regression analysis to test all the hypotheses. In particular regression analysis with dummy variables to test the hypothesis about gender, age, and living situation influences on the consumption of plant-based meat alternatives.

3.3. Validity, reliability and limitations

When conducting a study, it is fundamental to analyse its validity and reliability. The validity of a study collects the appropriate data and investigates whether the study measures what is intended to measure, in other words, it measures the degree of agreement of the results or conclusions gotten from the research

questionnaire with the real world. Heale R. and Twycross A. (2015) affirm there are three types of validity: content, construct and criterion. Content validity analyses whether the instrument adequately covers all the content that it should compared to the variable. In other words, does the instrument cover the entire domain related to the variable, or construct it was designed to measure? For instance, establishing face validity represents a method to assess content validity and consists in the activity when experts are asked their opinion about whether an instrument measures the concept intended. Regarding this study, my thesis supervisor, Pietro Lanzini, analysed the questionnaire and expressed his opinions about it. As a consequence, I changed the introduction part of the questionnaire, simplified some questions, eliminated other questions that were redundant and I added questions to study specific habits using the Self-Reported-Habit scale. After making these changes, I followed the second step to assess content validity and I pretested the questionnaire by asking four persons close to me to complete it. The respondents were 3 females and 1 male, 1 student and 3 workers. I chose them because I know I can get honest feedback and because they are not involved in business studies, so I could find out if the questions are understandable and also the amount of time that is needed to complete the questionnaire. The feedback was valuable because I received suggestions to formulate better the questions in the Italian language and I found out that it takes around 10 minutes to answer all of the questions of the questionnaire. The pilot study took only one day.

The second type of validity is represented by construct validity. It refers to whether you can draw inferences about test scores related to the concept being studied. Making references to this study, the questionnaire is not supposed to attribute a final score to each respondent. However, there can be analysed inferences about the questionnaire results and the topic studied. This type of analysis will be done in chapter 4 when making the factor analysis. Lastly, the third type of validity is represented by criterion validity. A criterion is any other instrument that measures the same variable. Correlations can be conducted to determine the extent to which the different instruments measure the same variable.

Validity can be ensured by choosing appropriate methods of measurement. That is why, I based my questionnaire on existing methods and measurement techniques,

such as ABC Model, the Oreg scale and Self Reported Index scale, trying to follow structured models from the other studies that were conducted in this field. Moreover, to assess validity it is important to use appropriate sampling methods to select subjects. Unfortunately, due to limited sample size, external validity, also called generalisation cannot be guaranteed. This is the case because there are some limitations in the sample population. The respondents are not representative of Italian society as a whole for different reasons. First of all, many of the respondents have between 21 and 25 years, people that I personally know and that would be likely to try and help me. Secondly, because most of my friends are female, my sample had more females than males. Also, a large number of respondents live with their parents meaning that probably they are not taking buying decisions on their own. Moreover, this topic might attract people that already have a vegetarian or a vegan diet, or that have already tried plant-based meat alternatives and want to express their satisfaction or dissatisfaction with these types of products. This means it cannot be a perfect generalisation when it comes to Italian society as a whole.

On the other hand, the reliability of a study measures whether results would be likely the same if the study performed on another example representative of the same population. Reliability can be assessed by checking the consistency of the results across time, across different observers, and across parts of the test itself. A reliable measurement is not always valid because the results might be reproducible, but they are not necessarily correct. Instead, if a method is not reliable, it probably is not valid. Heale R. and Twycross A. (2015) say it is not possible to give an exact calculation of reliability, but an estimate of reliability can be achieved through different measures. The three attributes of reliability are homogeneity (internal consistency), stability and equivalence. Homogeneity (internal consistency) is the extent to which all the items on a scale measure one construct and can be assessed using item-to-total correlation, split-half reliability, Kuder - Richardson coefficient and Cronbach's α. The last one, Cronbach's α, is the most commonly used test to determine the internal consistency of an instrument. In this test, the average of all correlations in every combination of split-halves is determined. Instruments with questions that have more than two responses can be

used in this test. The Cronbach's α result is a number between 0 and 1. An acceptable reliability score is 0.7 and higher. Referring to this questionnaire, the Cronbach's α result can be found in chapter 4.
Stability is tested using test-retest and parallel or alternate-form reliability testing. Test-retest reliability is assessed when an instrument is given to the same participants more than once under similar circumstances. A statistical comparison is made between participants' test scores for each of the times they have completed it. This indicates the reliability of the instrument. While parallel-form reliability (or alternate-form reliability) is similar to test-retest reliability except that a different form of the original instrument is given to participants in subsequent tests. The domain or concepts being tested are the same in both versions of the instrument but the wording of items is different.
Finally, equivalence is assessed through inter-rater reliability. This test includes a process for qualitatively determining the level of agreement between two or more observers. For my study, I assessed only the homogeneity (internal consistency) attribute using Cronbach's α.

My research presents some limitations. First of all, I cannot generalise my results to the Italian population as a whole because of the reasons explained before. Secondly, to increase reliability and to better understand the changes in consumer behaviour, it would be better to conduct a longitudinal study, gathering data from the same sample more than once, at different points in time, preferably before and after trying plant-based meat alternatives. Also, organising focus groups and conducting interviews would bring qualitative information useful to understand consumers' feelings and behaviours. Another important point is the fact that the topic of alternative meat products meat is still quite new, so many respondents have never heard or never tried these products. Moreover, there are probably many aspects that have not been researched yet and there are factors that I have ignored in my analysis, for instance, the effect of media on people. Also regarding this topic, there is a lot of research being done on cognitive dissonances, such as understanding why people say they love animals, but at the same time, they eat them. There are many more aspects, like what kind of message could be more appealing to Italian consumers to make them introduce meat alternatives in their

routine, but I decided to focus on a few very specific factors, also trying to avoid too long questionnaire that could alter respondents' answers.

Chapter 4. Interpretation of the results

4.1. Descriptive statistics and general analysis

To interpret the results regarding demographics I used descriptive statistics. It helps to describe and understand the features of my specific data set by giving short summaries about the sample and measures of the data.
The questionnaire that I distributed got 110 responses in total and all of them were valid with the filling-in rate of 100%. Table 6 represents a complete description of respondents' characteristics. Here bellow, I will focus on each item describing the results.

Gender
The respondents are not equally balanced between males and females. In fact, out of 110 respondents, 42 (38,2%) are males and 68 (61,8%) are females.

Age
48,2% of the respondents have between 21 and 25 years; then 27,3% of respondents have between 26 and 30 years, 11,8% have between 31 and 40, 7,3% have between 17 and 20; and 5,5% of respondents have between 41 and 60. None of the respondents has less than 16 and more than 60 years. So, the questionnaires cover almost all age ranges with 55,5% under 25 years and 44, 5% over 25 years.

Living in Italy
The majority of the respondents are currently living in Italy (94,5%), which is very good since the objective is to target Italian consumers. So, it is not fundamental that respondents have Italian citizenship, but it is important to be residents in Italy or currently living in Italy.

Occupation
51,8% of the respondents are students and 45,5% are workers, only 0,9% (one person) is unemployed and 1,8% (2 persons) are workers and students at the same

time, and no one is retired. It is a positive fact that there is an equal distribution between students and workers.

Education

48,2% of the respondents have Bachelor degrees, 19,1% have Master degrees and 7,3% have PhDs. On the other hand, 20,9% of the respondents have a secondary school diploma. It should be taken into consideration that 4,5% of respondents (5 persons) preferred not to answer this question.

Living situation

The majority of the respondents (55,5%) live with parents; 16,4% live with partners; 14,5% live alone; 8,2% live with partner and children; only 5,5% live with roommates; and no person is a single parent living only with their children.

Income

48,2% of respondents do not have their own income; 10,9% of respondents have their income between 500 and 1000 euros per month; 35,5% earn between 1000 and 2000 euros; 3,6% between 2000 and 3000 euros; then, there is 0,9% (1 person) that earns between 3000 and 4000 euros and 0,9% (1 person) that earns more than 4000 euros. The distribution is quite equal between the respondents who do not have a personal income and those who do have an income, however, their income is quite low.

Food expenses

17,3% of respondents do not have their own expenses, so they do not purchase food using their own money. 35,5% of respondents spend up to 50 euros on food, for themselves in a week; 27,3% of respondents spend between 50 and 100 euros; 15,5% spend between 100 and 200 euros; 2,7% spend between 200 and 300 euros; and 1,8% (2 persons) spend between 300 and 400 euros. No one spends more than 500 euros on food per week.

Diet

77,3% of the respondents affirm their diet is omnivorous, meaning they eat vegetables and meat/fish with no prevalence of one type over another. 13,6% of respondents affirm their diet is carnivorous, meaning they eat more meat and fish rather than other categories of food. 8,2% of respondents affirm their diet is vegetarian and no one has a vegan diet. One respondent answered that he does not eat meat and cheese for 7 years; and he/she eats few eggs and fish.

To analyse better the different diet categories I wanted to investigate what people answered the question regarding how often do they consume traditional meat in an average month (question 4). As it can be observed in Figure 4, there is not so big a difference between people affirming to have a carnivorous diet (4,00) and people affirming to have an omnivorous diet (3,53). The two groups consume meat in a similar amount. On the other hand, "vegetarian" and "other" categories have low values (1,44 and 1,00).

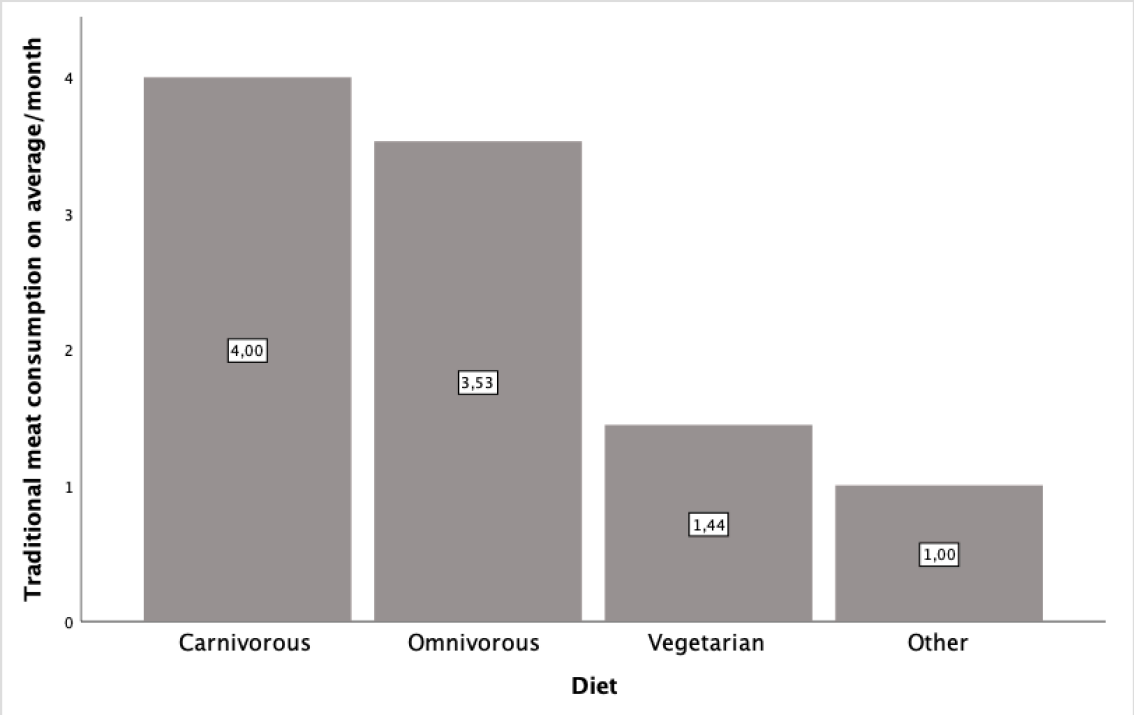

Figure 4: Traditional meat consumption on average month among different diet groups

Table 6: Despondents' demographics details (n=110)

Measure	Items	Frequency	Percentage (%)
Gender	Female	68	61,8
	Male	42	38,2
	Other	-	-
	Prefer not to answer	-	-
Age	Up to 16	-	-
	17-20	8	7,3
	21-25	53	48,2
	26-30	30	27,3
	31-40	13	11,8
	41-60	6	5,5
	More than 60	-	-
Living in Italy?	Yes	104	94,5
	No	6	5,5
Occupation	Student	57	51,8
	Working	50	45,5
	Unemployed	1	0,9
	Retired	-	-
	Student and worker	2	1,8
Education	Secondary school diploma	23	20,9
	Bachelor	53	48,2
	Masters	21	19,1
	PhD	8	7,3
	I prefer not to answer	5	4,5
Living situation	Alone	16	14,5
	With parter	18	16,4
	With partner and children	9	8,2
	Single parent	-	-
	With parents	61	55,5
	With roommate(s)	6	5,5
Personal income (euros/month)	Do not have own income	53	48,2
	500-1000	12	10,9
	1000-2000	39	35,5
	2000-3000	4	3,6
	3000-4000	1	0,9
	More than 4000	1	0,9
Personal food expenses (weekly/euros)	Do not have personal expenses	19	17,3
	Up to 50	39	35,5
	50-100	30	27,3
	100-200	17	15,5
	300-400	3	2,7
	400-500	2	1,8
	More than 500	-	-
Diet	Omnivorous	85	77,3
	Carnivorous	15	13,6
	Vegetarian	9	8,2
	Vegan	-	-
	Other…("I don't eat meat and cheese for 7 years. Few eggs and fish")	1	0,9

Figure 5 shows how much the different diet groups perceive animal farming as being damaging to the environment (question 7). People that have a carnivorous diet averaged 2,87 out of 5; those with an omnivorous diet averaged 3,85; and those with a vegetarian diet averaged 4,56. The category "other" includes only 1 person that didn't identify himself in the general diet categories. Figure 5 demonstrated that carnivorous people underestimate the consequences of animal farming on the environment and are less informed, while vegetarian people are more conscious about environmental topics. People with an omnivorous diet are in the middle.

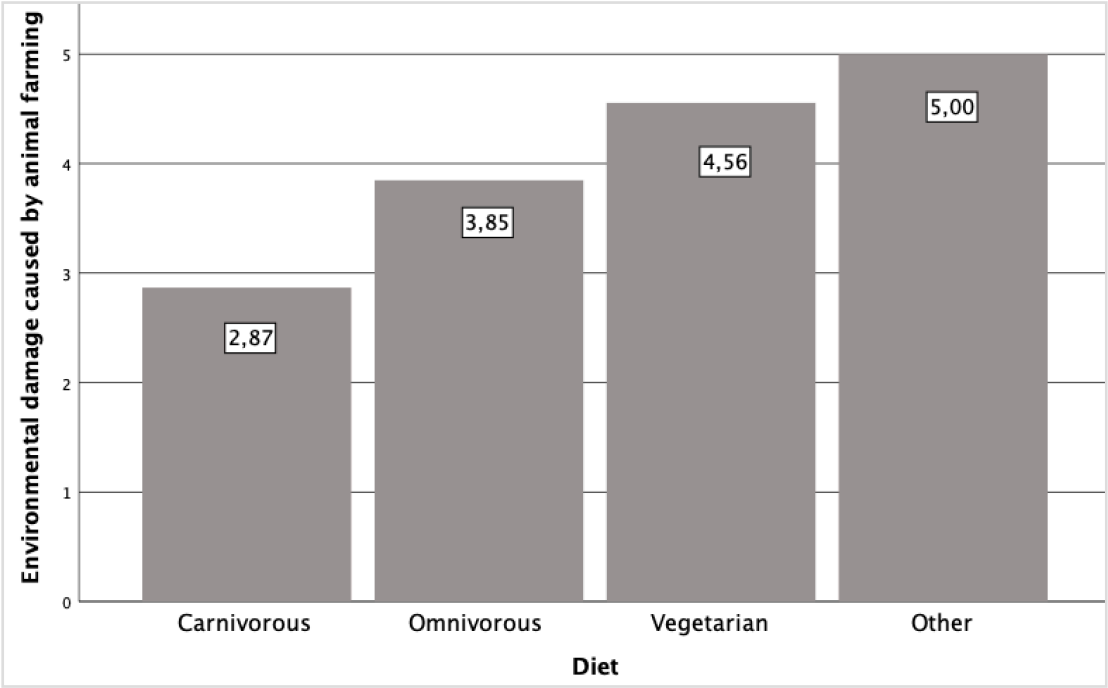

Figure 5: Respondent's perception about environmental damage caused by animal farming among different diet groups

Curious observations can be deduced by looking at Figure 6. It represents how much the different diet groups perceive health damage caused by the consumption of traditional meat (question 8). Also in this image, people following a carnivorous diet obtained the lowest rating (2,33) compared to people following an omnivorous diet (2,76), vegetarian diet (3,37) and others (5). Comparing these two graphs, it can be noticed that environmental damage has higher ratings in all of the diet categories compared to health damage, meaning that people are more

concerned about environmental damage associated with animal farming, rather than health damage associated with the consumption of traditional meat, but these aspects will be studied also in the next paragraphs.

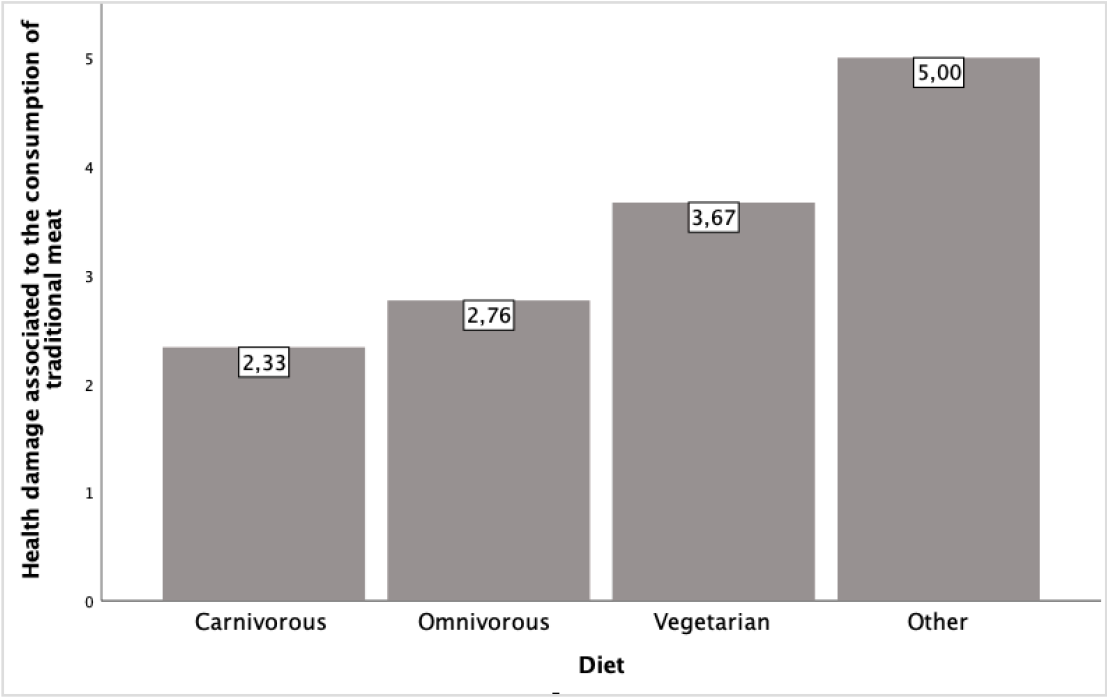

Figure 6: Respondent's perception about health damage caused by the consumption of traditional meat among different diet groups

Looking at the general data referring to plant-based meat alternative products, it can be affirmed that, more or less, half of the respondents know and have tried these products. In particular, at the question about how often do they hear about PBMA (question 2), only 7 respondents (6,4%) answered they have never heard about these products, 28 (25,5%) answered "a little", 26 (23,6%) answered "so and so", 35 (31,8%) answered "often" and 14 (12,7%) answered "very often". This result puts in evidence that these products are not known by everybody, however, there is a prevalence of people who have already heard about PBMA.

Moreover, when respondents were asked about whether they have ever tried PBMA products (question 3), 50,9% answered "no" and 49,1% answered "yes". Despite knowing about the existence of these products, only less than half of respondents actually tried them. In addition, when asked to rate how often do they consume plant-based meat alternatives on a scale from 1 to 5 (question 5), 87

(79,1%) answered “1” meaning never, 20 (18,2%) answered “2”, 1 (0,9%) respondent answered “3” and 2 (1,8%) respondents answered “4”. These data put in evidence that people are far from consuming plant-based meat alternatives regularly.

To summarise, 93,3% of respondents have heard about plant-based meat alternatives, 49,1% have tried them, but less than 21% consume them regularly. It would be interesting to discover the reasons for these facts. However, in a long term perspective, the majority of respondents think they will consume more often PBMA (question 6). This might be due to different reasons including sustainability, health or animal suffering concerns associated with traditional meat consumption.

Analysing the knowledge of respondents about plant-based meat alternative products, the results show that 81 (73,64%) do not know much about these products (question 9.3), moreover, 51 (46,35%) do not know where to find them (question 9.2), 83 (75,45%) do not know how to cook them (question 9.4) and 53 (48,18%) affirm it is difficult to find information about plant-based meat (question 9.13). Referring to the taste, it is interesting to observe that 69 (62,73%) of respondents answered they do not know whether the plant-based meat alternative products are tasty, 29 (26,36%) consider them to be tasty, while 12 (10,91) consider them not tasty. The paradox is that some respondents who have never tried PBMA answered that these products are not tasty, while none of them considers PBMA to be tasty. This lead to the conclusion that there is a negative bias regarding the taste of these products.

Referring to the price (question 9.6), 64 (58,18%) of the respondents do not know whether plant-based meat is expensive, 37 (33,64%) consider it is expensive and only 9 (8,18%) consider it not expensive. But, if plant-based meat alternatives were less costly than traditional meat, 38 (34,55%) of respondents do know if they would buy them for sure; while 39 (35,45%) answered they agree or strongly agree, and 33 (30%) answered they disagree or strongly disagree (question 9.10). The fact is that 22 respondents who think that PBMAs are too expensive, would buy them if they were less costly than traditional meat, on the other hand, 10 respondents will still not buy them. This fact underlines that the price is not the main barrier that prevents consumers from buying PBMA.

One of the advantages of plant-based meat alternative products is that they are easy to cook. In fact, 36 (32,73%) respondents of the questionnaire answered they agree or strongly agree with the statement “Plant-based meat alternatives are easy to cook” (question 9.7), while 7 (6,3%) disagree or strongly disagree, however, the majority, 67 (60,91%) do not know about this advantage.

Regarding the sustainability aspect associated with plant-based meat products, when respondents were asked if plant-based meat is sustainable (question 9.8), 61 (55,45%) respondents answered they agree or strongly agree, 37 (33,64%) do not know and 12 (10,91%) disagree or strongly disagree. The interesting fact is that the majority of respondents (58 corresponding to 96,72%) of those who agree or disagree also believe that animal farming is harmful to the environment, answering from “3” to “5” at question 7.

Regarding the health aspect associated with plant-based meat products, when respondents were asked if plant-based meat is healthy (question 9.9), 44 (40%) respondents answered they agree or strongly agree, 54 (50%) do not know and 12 (10%) respondents disagree or strongly disagree. A correlation can be done with the question associated with the potential harm of traditional meat on people’s health (question 8). In fact, 30 (68%) respondents who answered they agree or strongly agree with the previous question also believe that traditional meat is harmful to their health, answering from “3” to “5” at question 8.

Moreover, analysing the aspect of feeling good associated with the consumption of plant-based meat alternatives (question 9.11), not necessarily correlated to health or sustainability, 30 (27,27%) respondents affirm they agree or strongly agree with the statement “I feel good with myself when I consume plant-based meat”, while 55 (50%) respondents answered they do not know, and 25 (22,73%) respondents disagree or strongly disagree.

One statement that obtained the majority of answers “agree” or “strongly agree” is about the animal suffering (question 9.12). In fact, 67 (60,91%) respondents affirm the consumption of plant-based meat alternatives at a global level would improve animal lives. On the other hand, 33 (30%) respondents answered they do not know and 10 (9,09%) disagree or strongly disagree. Focusing on the group of people that answered “agree” or “strongly agree”, 3 persons are affirming their diet is

carnivorous, 55 persons affirm their diet is omnivorous and 8 persons affirm their diet is vegetarian.

Regarding the living situation of respondents, 68 (61,82%) affirm they disagree or strongly disagree with the statement "I live with other people and I can't freely decide what to consume" (question 9.14), while only 11 (10%) respondents answered they do not know and 31 (28,18%) respondents agree or strongly agree. These results underline that, generally, respondents do not perceive their living situation as a barrier when deciding what to consume. However, analysing the group that agreed or strongly agreed with the sentence, 3 persons answered they live with their partner, 1 with their partner and children, 21 with their parents, 3 with their roommates and surprisingly 3 persons affirm they live alone. From these results, I can conclude that living with parents could be a barrier when deciding freely what products to consume.

Analysing the aspect of food neophobia, when respondents were asked whether they agree/disagree with the statement "I don't like trying new types of food" (question 9.15), 96 (87,27%) respondents answered they disagree or strongly disagree, 5 (4,55%) answered they do not know and 9 (8,18%) answered they agree or strongly agree. This led to the deduction that the respondents are not afraid of trying new types of food.
Another important aspect is the culture. At the statement "I value cultural and traditional aspect of food", 55 (50%) respondents affirm they agree or strongly agree, 28 (25,45%) do not know, and 27 (24,55%) affirmed they disagree or strongly disagree. These results put in evidence that, for the participants of the survey, the cultural aspect is important. An important consideration is the fact that those who answered they do not like trying new types of food, answered that they value cultural and traditional aspects of food.

The results regarding the occasions when, where and with whom it is more appropriate to eat plant-based meat (questions 10.1-10.6), show that respondents prefer to consume these products when eating with their family on a weekday, when they are eating alone or when they are invited to eat with friends. On the

other hand, the least appropriate occasions seem to be more formal contexts, such as when eating Sunday dinner with family, when invited for dinner in a restaurant or at a business lunch. It can be concluded that in general, it is more appropriate to consume plant-based meat in an informal context, eating alone, with friends or with family on a normal day. Formal contexts might not be appropriate because people might want to avoid attention when eating something unusual (see Figure 7).

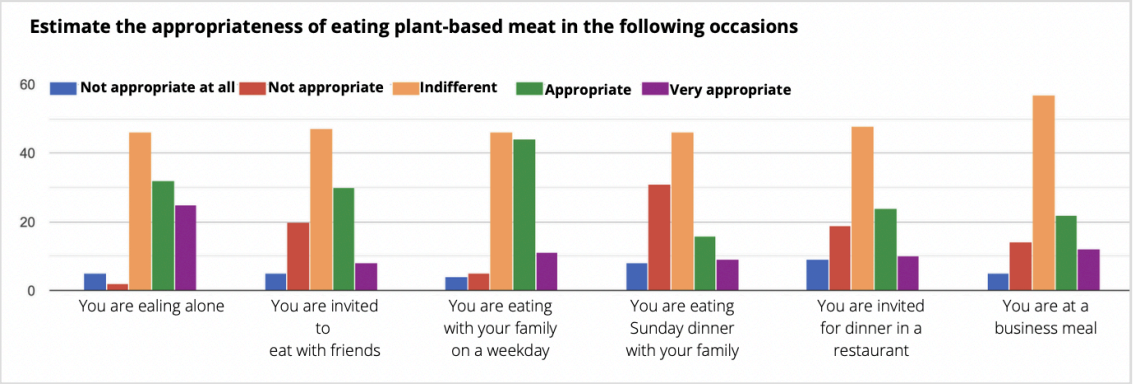

Figure 7: Results questions 10.1-10.6

Further deductions can be done by analysing the influence that close people, such as family, friends and colleagues have on the respondents (questions 11.1-11.6). The results show that from the three groups, friends are most likely to think that the respondents should consume plant-based meat. In fact, 10 respondents declared that they agree with the statement "My friends think I should consume plant-based meat alternatives" (question 11.1), only 5 respondents agree with the statement "My family think I should consume plant-based meat alternatives" (question 11.3) and only 5 respondents agree with the statement "My colleagues/ classmates think I should consume plant-based meat alternatives" (question 11.5). It is important to highlight that, in general, the majority of respondents disagree or strongly disagree with these statements.

Then, it is interesting to discover whether the opinion of close people is important to our respondents. The results show that the opinion of the family about food consumption is more important to our respondents than the friends' opinion or colleagues' opinion. So, 30 respondents agree or strongly agree with the statement

"What my family think about my consumption is important to me" (question 11.2), only 10 respondents agree with the statement "What my friends think about my consumption is important to me" (question 11.4), and only 4 respondents agree with the statement "What my friends think about my consumption is important to me" (question 11.6). Also, in this case, an important observation is the fact that the majority of respondents disagree or strongly disagree with these statements.

4.2. Factor analysis and reliability analysis

Factor analysis represents a method to assess construct validity and consists of a technique that is used to reduce a large number of variables into fewer numbers factors. To conduct factor analysis for my study, it was necessary to create four categories: attitudinal factors, personal capabilities, contextual forces and habits.

Starting by attitudinal factors, I had 7 items. To build construct validity, the items were subjected to factor analysis by using principal components analysis with direct oblivion rotation. The Kaiser-Meyer-Olkin value was 0,767 (above the recommended value of 0,6) and Bartlett's Test of Sphericity reached statistical significance with a p-value less than 0,001; which means the correlation matrix of the attitude variable is factorable. Analysing the 7 items I obtained 2 components with eigenvalue over the cut-off value 1. So, I decided to take into consideration both components because their cumulative variance explained 60,26 % of the variance. Table 7 shows the results of the factor analysis of the 2 components. Regarding the first component, all the items loaded above 0,6; while for the second component 3 items were relevant: taste, future consumption and feeling good with themselves.

For the personal capabilities variable, I had 5 items. Also in this case the items were subjected to factor analysis by using principal components analysis. The Kaiser-Meyer-Olkin value was 0,696 (above 0,6) and Bartlett's Test of Sphericity with p-value less than 0,001. Analysing the 5 items I obtained 2 components with eigenvalue over the cut-off value 1. Also, in this case, I decided to take into

consideration both components because their cumulative variance explained 66,94 % of the variance. Table 8 shows more details about the factor analysis of the 2 components. Looking at the first component, 4 items loaded above 0,7 and they represent the knowledge a person has about plant-based meat; while for the second component only one item was particularly relevant, affordability.

For the context variable, I had 9 items. The Kaiser-Meyer-Olkin value was 0,8 (above 0,6) and Bartlett's Test of Sphericity with p-value less than 0,001. Analysing the 9 items, I obtained three components with eigenvalue over the cut-off value 1. The first component explained 51,16% of the variance, the second component explained 14,69% of the variance and the third component explained 11,11% of the variance. Table 9 shows more details about the factor analysis of the three components. Regarding the first component, all the items were relevant, above 0,5. However regarding the second component, only 3 items were relevant: friends, family and colleagues' influence and regarding the third component, only 2 items were relevant: eating alone and eating with family. In this way, I noted that the first component refers mostly to contextual occasions, while the second component refers to the influence that close people have on the respondents.

Table 7: Factor Analysis of Attitude variable

Variable	Component	Eigenvalue	Variance Explained	Item	Factor Loading component 1	Factor Loading component 2
Attitudinal factors	1	3,135	44,79%	Animal care	0,784	-0,156
				Sustainability	0,695	-0,456
				Healthiness	0,639	-0,504
				Preparation	0,606	-0,120
	2	1,083	15,47%	Taste	0,639	0,505
				Future	0,600	0,471
				Good feeling	0,704	0,325

Table 8: Factor Analysis of Personal Capabilities variable

Variable	Component	Eigenvalue	Variance Explained	Item	Factor Loading component 1	Factor Loading component 2
Personal capabilities	1	2,325	46,49%	Existence	0,664	-0,277
				Availability	0,766	-0,086
				General info	0,844	-0,005
				Cooking	0,756	0,187
	2	1,023	20,45%	Affordability	0,110	0,951

Table 9: Factor Analysis of the Contextual Forces variable

Variable	Component	Eigen value	Variance Explained	Item	Factor Loading component 1	Factor Loading component 2	Factor Loading component 3
Contextual forces	1 (Occasions)	4,605	51,16%	Eating alone	0,581	-0,218	0,666
	2 (Occasions)	1,322	14,69%	Eating with friends	0,827	-0,150	-0,325
				Eating with family	0,640	-0,443	0,461
				Eating with family on holiday	0,736	-0,280	-0,310
				Dinner at restaurant	0,873	-0,087	-0,290
				Business launch	0,870	-0,209	-0,148
	3 (Influence)	1,000	11,11%	Friends influence	0,540	0,652	0,039
				Family Influence	0,631	0,417	0,134
				Colleagues influence	0,663	0,572	0,134

Regarding the habit variable, I used questions from 2 models: Oreg Resistance to Change Scale and Self Reported Habit Index. Both of them have been applied in different contexts and they already proved to be valid and reliable. However, I decided to conduct my analysis and here are the results. I divided the habit variable into 3 other categories: general predisposition to change corresponding to the Oreg scale, a specific behaviour regarding consuming traditional meat (SRHI scale)

and a specific behaviour regarding buying traditional meat (SRHI scale). The general predisposition to change category is composed of 4 items. The Kaiser-Meyer-Olkin value was 0,644 (above 0,6) and Bartlett's Test of Sphericity with p-value less than 0,001. Analysing the 4 items, I obtained one component with eigenvalue over the cut-off value 1 which explained 45,12 % of the variance. Table 10 shows other details.

Table 10: Factor Analysis of the Habit variable - General predisposition change

Variable	Component	Eigenvalue	Variance Explained	Item	Factor Loading component 1
General predisposition to change (Oreg)	1	1,805	45,12%	Routine seeking	0,642
				Emotional reaction	0,673
				Short-term thinking	0,802
				Cognitive rigidity	0,545

Then, I conducted the factor analyses on the 12 items of the SRHI regarding consuming traditional meat. I obtained three eigenvalues greater than one: 6,433; 1,233, and 1,036. The first component accounted for 53,61% of the variance, the second for 20,28% and the third for 8,63%. The Kaiser-Meyer-Olkin value was 0,894 (above 0,6) and Bartlett's Test of Sphericity with p-value less than 0,001.

Finally, I conducted the factor analyses on the 12 items of the SRHI regarding buying traditional meat. I obtained two eigenvalues greater than one: 7,577 and 1,080. The first component accounted for 63,14% of the variance and the second for 9%. The Kaiser-Meyer-Olkin value was 0,922 (above 0,6) and Bartlett's Test of Sphericity with p-value less than 0,001.

Reliability can be assessed through the use of Cronbach's α, which is a measure of internal consistency. The attitudinal factors variable has Cronbach's α equal to 0,792. This value is very good since the acceptable values for variables with less than 10 items are higher than 0,5. In this case, the variable has 7 items. Moreover, looking at the correlation matrix, all the values are positive, meaning that all the

questions are posed correctly, so they go in the same direction. In addition, the corrected item-total correlation corresponds to the correlation of each item with all other items combined and it is higher than 0,4 for each item.

Analysing the personal capabilities variable, Cronbach's α is 0,690. This value is over the limit of 0,5, so it is good because the variable contains only 5 items. The correlation matrix contains one negative value highlighting the fact that there can be inconsistency in the two questions. However, the value is small and around 0, meaning that the inconsistency is not so significant. Looking at the corrected item-total correlation, the first 4 values are higher than 0,4; while for the affordability, the value corresponds to 0,064. At this point, I considered the possibility to delete the item, but I believe that it represents an important characteristic of the personal capability variable and I decided to leave it.

Regarding the contextual forces variable, Cronbach's α is 0,876. This value is very good since the variable contains 9 items. Moreover, the correlation matrix contains only positive values and the corrected item-total correlation is higher than 0,4 for each item.

Analysing the habit variable, it should be taken into consideration the 3 categories: general predisposition to change, the specific behaviour regarding consuming traditional meat and the specific behaviour regarding buying traditional meat. The general predisposition to change consists of 4 items and its Cronbach's α corresponds to 0,548. The specific behaviour regarding consuming traditional meat has 12 items and its Cronbach's α corresponds to 0,92. Lastly, the specific behaviour regarding buying traditional meat also consists of 12 items and its Cronbach's α corresponds to 0,947. Moreover, the correlation matrix of all the 3 categories contain only positive values and the corrected item-total correlation is higher than 0,4 for each item.
Concluding this paragraph, it can be affirmed that the questionnaire is valid and reliable.

4.3. Hypotheses testing - ABC Model factors

To analyse whether the model fits the field of research I stated some hypotheses. Starting with hypotheses 1, 2 and 3, I wanted to study if consumers' attitudinal factors, personal capabilities and contextual forces towards plant-based meat alternatives have a positive and significant relationship towards their behaviour of consuming these products. As explained in chapter 3, the most appropriate way to test these hypotheses is through the use of a multiple regression analysis. Equation 1[1] (paragraph 3.1) expresses H1, H2 and H3. Based on the questionnaire (Table 4) and following the structure of Equation 1, I had one dependent variable (B - the behaviour of consuming plant-based meat alternative products) associated with question 5 of the questionnaire, and three independent variables (A - attitudinal factors, PC - personal capabilities, C - contextual variables). The independent variables represent the means of the results of the specific questions (see Table 5 from paragraph 3.2).

Firstly, I examined the assumptions of multiple regression. The Pearson Correlation Matrix was used to check the multicollinearity of the data. The coefficients were low, ranging between -0,090 and 0,564, which showed no violation of the assumptions of perfect multicollinearity, and enabled a multiple regression analysis. In addition, I checked the variance inflation factor (VIF) for all the variables and all of them were below 10, which confirmed no multicollinearity. Moreover, also Tolerance value is an important indicator of multicollinearity and in this case, all the values were higher than 0,1 reinforcing the previous statement. Two outliers were found in the dependent variable, but I decided to keep them because removing them could have given misleading results. The P-P Plot of regression standardised residual showed points close to the line and analysing the scatterplot of the residuals, only 2 points exceeded the value of 3, the outliers. In addition, there was a linear pattern indicating that the model is not complete and that there should be other independent variables.

[1] Equation 1: $B = B_1A + B_2PC + B_3C$

Secondly, linear multiple regression was used to test hypotheses 1, 2 and 3. The three independent variables explained 32,7% of the variance for B (behaviour of consuming plant-based meat alternative products). In fact, the determination coefficient (R^2) corresponds to 0,327 and the adjusted R^2 corresponds to 0,308. Moreover, the F test (tests the significance of the variables simultaneously) is significant, with a p-value less than 0,001. Hence, the equation fitted the data very well and Table 11 summarises the obtained results.

H1 tested if consumers' attitudinal factors (values, beliefs, norms) towards plant-based meat alternatives have a positive and significant relationship to their behaviour of consuming these products. The Standardised Coefficient Beta of A was 0,230 ($p<0,05$), while the Unstandardised Coefficient Beta of A, corresponding to B_1 was 0,210. So, if A increased by 1 point, B would have increased by 0,210. It showed that attitudes towards plant-based meat alternatives have a positive and significant impact on the behaviour of consuming these products. H1 was supported.

H2 tested if consumers' personal capabilities towards plant-based meat alternatives have a positive and significant relationship to their behaviour of consuming these products. The Standardised Coefficient Beta of PC was 0,430 ($p<0,01$), while the Unstandardised Coefficient Beta of PC, corresponding to B_2 was 0,332. So, if PC increased by 1 point, B would have increased by 0,332. It showed that personal capabilities towards plant-based meat alternatives have a strong, positive and significant impact on the behaviour of consuming these products. H2 was supported.

H3 tested if consumers' contextual forces towards plant-based meat alternatives have a positive and significant relationship to their behaviour of consuming these products. The Standardised Coefficient Beta of C was 0,189 ($p<0,05$), while the Unstandardised Coefficient Beta of C, corresponding to B_3 was 0,168. So, if C increased 1 by point, B would have increased by 0,168. It showed that contextual forces towards plant-based meat alternatives have a positive and significant impact on the behaviour of consuming these products. Also, H3 was supported.

As a conclusion, comparing the three independent variables, I can affirm that the personal capabilities variable is the best predictor of the behaviour compared to the other variables. I think this is due to the fact that knowledge, in particular about the existence of the plant-based meat alternatives, general information, preparation and affordability of these products is crucial when choosing what to buy and consume. Also, attitudinal factors, such as animal care, sustainability and healthiness associated with plant-based products are very important to the consumers. Then, contextual forces, such as occasions when eating alone, with family or friends; or people's influence around us is important, but not so important as personal capabilities and attitudes.

Table 11: Results from the regression analysis - Equation 1

Independent Variable	Unstandardised Coefficient		Standardised Coefficient Beta	t	P-value
	B	Standard error			
Attitudinal factors	0,210	0,089	0,230	2,356	0,020
Personal capabilities	0,332	0,062	0,430	5,316	<0,001
Contextual forces	0,168	0,083	0,198	2,030	0,045
			Observations		110
			R-squared		0,327
			Adj. R-squared		0,308
			F-statistics		17,203

Since it is very difficult to analyse habits associated with the consumption of plant-based meat alternative products because these products are new and consumers have not developed yet any habits, I decided to analyse them by calculating the general predisposition to change and integrating this variable in the ABC model. I also want to analyse how the other three variables change with the insertion of the habit variable.

As already explained, the general predisposition to change variable is composed of 4 items: routine seeking, emotional reaction, short-term thinking and cognitive rigidity. The results of the survey show that the means of these items are 2,08; 3,11; 2,54; and 2,75; respectively. The more this value is close to 5, the more

respondents tend to resist, avoid changes and develop habits. In my sample, the highest mean is represented by emotional reaction to imposed change, reflecting the amount of stress and uneasiness the individuals experience when confronted with imposed change. On the other hand, the lowest mean is represented by routine seeking which represents the extent to which individuals enjoy and seek out stable and lasting routines in their lives. In the middle, there are short-term thinking and cognitive rigidity. Short-term thinking is about whether individuals focus on the short-term problems that are part of most changes or whether they focus on the potential long-term benefits of change. Finally, cognitive rigidity involves a tendency to tenaciously hold on to one's views (Oreg, 2003). The mean of the 4 items corresponds to 2,62, meaning that the respondents are generally indifferent to changes with a slight tendency to avoid them.
Now, I would like to compare these results to the results of an online survey where 18452 respondents participated from all over the world (pluto.huji.ac.il). The survey contains 17 questions corresponding to the full questionnaire designed by Oreg (2003). However, the results can be quite inaccurate since this is an online questionnaire, open to everyone. In addition, it can be filled multiple times by the same individual and only people who know English can complete it, but I decided to compare my results to it because the survey contains a high sample size. I rescaled the results from Likert 6 point scale to Likert 5 point scale in order to allow a better comparison with my data and the means I obtained are 2,23 for routine seeking; 2,7 for emotional reaction; 2,22 for short-term thinking; and 2,83 for cognitive rigidity. Overall, the mean of the 4 items is 2,503. From these results, it can be deduced that, generally, the respondents of the survey (Italians) seem to be more resistant to change compared to the world population. In particular, the score is higher for the emotional reaction to imposed change and short-term thinking, while the score is lower compared to the world population for routine seeking and cognitive rigidity.

H4 tests whether Italian's resistance to change score has a negative and significant relationship towards the consumption of plant-based meat alternative products. Also, in this case, the most appropriate way to test hypothesis 4 is through the use

of a multiple regression analysis. Equation 1 becomes Equation 2[2] (paragraph 3.1) expressing also H4. In this case, I had one dependent variable (B) associated with question 5 of the questionnaire, and four independent variables (A - attitudinal factors, PC - personal capabilities, C - contextual variables, Hr - habits associated with resistance to change score).

Firstly, I examined the assumptions of multiple regression and the situation did not change with respect to the previous model. An observation regards the correlation matrix because the habit variable correlates negatively with all other variables. But the correlations are not very strong, showing no violation of the assumption of perfect multicollinearity. Secondly, conducting the linear multiple regression, the four independent variables explained 33,9% of the variance for B. In fact, R^2 corresponds to 0,339 and the adjusted R^2 corresponds to 0,314. Moreover, the F test is significant, with a p-value less than 0,001. Hence, Equation 2 fitted the data very well, a little better than Equation 1 and Table 12 summarises the obtained results.

Table 12: Results from the regression analysis - Equation 2

Independent Variable	Unstandardised Coefficient		Standardised Coefficient Beta	t	P-value
	B	Standard error			
Attitudinal factors	0,193	0,090	0,211	2,154	0,034
Personal capabilities	0,331	0,062	0,429	5,321	<0,001
Contextual forces	0,162	0,082	0,191	1,963	0,052
Habits (RTC)	-0,085	0,063	-0,110	-1,350	0,180
			Observations		110
			R-squared		0,339
			Adj. R-squared		0,314
			F-statistics		13,458

H4 tests if the Italian's resistance to change score has a negative and significant relationship towards the consumption of plant-based meat alternative products. The Standardised Coefficient Beta of Hr was -0,110 with a p-value equal to 0,180; while the Unstandardised Coefficient Beta of Hr, corresponding to B_4 was -0,085.

[2] Equation 2: $B = B_1A + B_2PC + B_3C + B_4Hr$

So, if Hr increased by 1 point, B would have decreased by 0,085. The negative sign of B_4 indicates that resistance to change is negatively correlated with the behaviour of buying plant-based meat. The higher is the resistance to change score, the fewer people will buy these products, and this makes sense. So, the resistance to change score has a negative, but no significant impact on the behaviour of consuming plant-based meat alternative products because the p-value is very high. H4 was not supported.
In addition, analysing the Standardised Coefficients Beta of the other independent variables, it can be observed that personal capabilities and attitudinal factors continue to be significant, but contextual forces have a p-value equal to 0,052 indicating that this variable is at the limit, tending to be not significant.

Analysing habits from another point of view, I used Self Reported Habit Index (Verplanken & Orbell, 2003) to evaluate how strong is their habit of consuming (questions 13.1-13.12) and buying (questions 14.1-14.12) traditional meat. I wanted to analyse also the differences between these two specific habits because often they do not correspond. The results show that consuming traditional meat has a higher mean (3,198) compared to buying traditional meat (3,117). This means that consumption is stronger as a habit, is more automatic and repetitive; while “buying” requires some physical or mental effort. Moreover, “buying” could be planned in advance, while “consuming” is something that could be done at the moment. However, the means indicate the two habits are quite strong. Looking at the data, the answers are similar between the two habits, except for the questions 13.5 and 14.5 (“I do without thinking"). Many answered they do consume traditional meat without thinking, while the majority disagree regarding buying traditional meat without thinking. So, as explained before, consumers think more when they have to decide what to buy because they have more possibilities, meanwhile when consuming, they just prepare what they already have in the fridge. Another difference is for questions 13.6 and 14.6 (“that would require effort not to do it”). The results show that it would require more effort not to consume traditional meat rather than not to buy traditional meat. This fact highlight that “consuming” is a consequence of “buying”, and that is why there have to be changed

the buying habits of consumers in order to change something in the overall consumption of traditional meat.

Habits associated with consuming or buying traditional meat represent a possible obstacle for consumers to try alternative products, such as plant-based meat alternatives. That is why I want to test if consumers' habits of buying traditional meat have a negative and significant relationship towards their behaviour of consuming plant-based meat alternatives. So, I stated hypothesis 5 (H5) and respectively I changed the original equation into Equation 3[3], without taking into consideration the variable associated with habits, resistance to change, because it resulted to be not significant. Moreover, I decided to test "buying" habit, not "consuming" habit because it represents the cause of consumption and I think it's more important.
Firstly, I examined the assumptions of multiple regression and the situation did not change with respect to the original model of Equation 1. Also in this case, in the correlation matrix, the habit variable correlates negatively with all other variables. It is normal since the more one has developed strong habits of buying traditional meat, the less he/she has positive attitudes, personal capabilities and favourable context forces towards plant-based meat alternative products. The correlations are not very strong, ranging from -0,416 to 0,564; showing no violation of the assumption of perfect multicollinearity. Secondly, conducting the linear multiple regression, the four independent variables explained 36,5% of the variance for B. In fact, R^2 corresponds to 0,365 and the adjusted R^2 corresponds to 0,341. Moreover, the F test is significant, with a p-value less than 0,001. Hence, Equation 3 fitted the data very well, a little better than Equation 1 and 2. Table 13 summarises the obtained results.

H5 tests if consumers' habit of buying traditional meat has a negative and significant relationship towards their behaviour of consuming plant-based meat alternative products. The Standardised Coefficient Beta of Hs was -0,223 with a p-value equal to 0,014; while the Unstandardised Coefficient Beta of Hs, corresponding to B_5, was -0,131. So, if Hs increased by 1 point, B would have

[3] Equation3: $B = B_1A + B_2PC + B_3C + B_5Hs$

decreased by 0,131. The negative sign of B_5 indicates that SRHI associated with the habit of buying traditional meat is negatively correlated with the behaviour of consuming plant-based meat. The higher is the SRHI score, the fewer people will consume PBMA. So, a consumer's habit of buying traditional meat has a negative and significant impact on the behaviour of consuming plant-based meat alternative products because the p-value is very low. H5 was supported.

In addition, analysing the Standardised Coefficients Beta of the other independent variables, it can be observed that personal capabilities continue to be significant, but contextual forces have a p-value very high indicating that this variable is not significant. Moreover, attitudinal factors have a p-value equal to 0,053, being at the limit of acceptance, however with a tendency of non-significance.

It is interesting to observe how these coefficients change and how significant the personal capabilities continue to be in predicting the consumption of plant-based meat alternatives. Knowledge about the existence, the preparation, the ingredients, the affordability of these products is very important. Moreover, habits associated with buying traditional meat is also very important. The more one is buying traditional meat, the less is buying other products to substitute meat. On the other hand, contextual forces including people's influence (family, friends, colleagues) do not have an important impact, neither the contextual situation (business launch, dinner with family, etc). In addition, also attitudes and values regarding sustainability, animal suffering and healthiness have less importance compared to habits associated with meat.

Table 13: Results from the regression analysis - Equation 3

Independent Variable	Unstandardised Coefficient		Standardised Coefficient Beta	t	P-value
	B	Standard error			
Attitudinal factors	0,173	0,088	0,189	1,956	0,053
Personal capabilities	0,299	0,062	0,388	4,801	<0,001
Contextual forces	0,105	0,084	0,125	1,250	0,214
Habits (SRHI)	-0,131	0,052	-0,223	-2,499	0,014
			Observations		110
			R-squared		0,365
			Adj. R-squared		0,341
			F-statistics		15,103

4.4. Hypotheses testing - Demographics, barriers, concerns

By stating hypothesis 6, I wanted to study if a person's socio-demographic background (age, gender and living situation) influences significantly the behaviour of consuming plant-based meat alternative products. In chapter 3, I explained that the most appropriate way to test this hypothesis is through the use of multiple regression analysis including dummy variables. Equation 4[4] (paragraph 3.1) expresses H6 taking into consideration the independent variables that were significant in the previous equations. Following the structure of Equation 4, I had one dependent variable (B - the behaviour of consuming plant-based meat alternative products), four independent variables (A - attitudinal factors, PC - personal capabilities, C - contextual variables, Hs - habits associated with SRHI of buying traditional meat) and dummy variables Gender 1 to 3, Age 1 to 6 and LS 1 to 5 (Living Situation) (see question 16, 17 and 19).
An important consideration is the fact that afterwards, I excluded the variables Gender2, Gender3, Age1, Age6 and LS4 since nobody answered "other" and "prefer not to answer" for gender; nobody answered "up to 16" and "more than 60" when asked about the age; and nobody answered "single parent" when asked about the living situation, hence these dummy variables were taken out of the analysis. Moreover, I decided that the baseline for the analysis will be Gender="female", Age="from 21 to 25", Living situation="with parents" because it represents the largest category group (see Table 6, paragraph 4.1) and could represent the best way of comparison.

Also in this case I started by examining the assumptions of multiple regression. The Pearson Correlation Matrix was used to check the multicollinearity of the data. The coefficients were low, ranging between -0,416 and 0,564, which showed no violation of the assumptions of perfect multicollinearity, and enabled a multiple regression analysis. In addition, the VIF for all the variables was below 10 and the Tolerance value was higher than 0,1 for all the variables. Two outliers were found as in the previous cases. The P-P Plot of regression standardised residual showed

[4] Equation4 : $B = B_1A + B_2PC + B_3C + B_5Hs + B_6Gender1 + B_7Gender2 + B_8Gender3 + B_9Age1 + B_{10}Age2 + B_{11}Age3 + B_{12}Age4 + B_{13}Age5 + B_{14}Age6 + B_{15}LS1 + B_{16}LS2 + B_{17}LS3 + B_{18}LS4 + B_{19}LS5$

points close to the line and the scatterplot of the residuals showed 2 points exceeding the value of 3. In addition, there was a linear pattern indicating that the model is still not complete.

The independent variables of the Equation 4 explained 41,2% of the variance for B (behaviour of consuming plant-based meat alternative products). In fact, R^2 corresponds to 0,412 and the adjusted R^2 corresponds to 0,332. Moreover, the F test is significant, with a p-value less than 0,001. Hence, the equation fitted the data very well and Table 14 summarises the obtained results.

Table 14: Results from the regression analysis - Equation 4

Independent Variable	Unstandardised Coefficient		Standardised Coefficient Beta	t	P-value
	B	Standard error			
Attitudinal factors	0,211	0,095	0,231	2,214	0,029
Personal capabilities	0,314	0,065	0,407	4,843	<0,001
Contextual forces	0,127	0,092	0,150	1,373	0,173
Habits (SRHI)	-0,117	0,054	-0,199	-2,168	0,033
Gender1 (male)	-0,012	0,099	-0,011	-0,123	0,903
Age2 (17-20)	0,054	0,183	0,025	0,294	0,769
Age3 (26-30)	-0,029	0,118	-0,023	-0,249	0,804
Age4 (31-40)	-0,266	0,181	-0,152	-1,471	0,145
Age5 (41-60)	-0,063	0,236	-0,026	-0,268	0,789
LS1 (alone)	0,211	0,140	0,132	1,507	0,135
LS2 (partner)	0,063	0,149	0,041	0,422	0,674
LS3 (partner and children)	0,291	0,212	0,142	1,373	0,173
LS5 (roommates)	-0,296	0,210	-0,119	-1,413	0,161
			Observations		110
			R-squared		0,412
			Adj. R-squared		0,332
			F-statistics		5,167

H6 tested if a person's socio-demographic background (age, gender and living situation) influences significantly the behaviour of consuming plant-based meat alternative products. The Standardised Coefficient Beta of Gender1 was 0,011 (p=0,903), while the Unstandardised Coefficient Beta of Gender1, corresponding to B_6 was -0,012. So, it means that the behaviour of males is lower compared to the behaviour of females by 0,012, but the p-value indicates that this is not significant.

Also, the other variables associated with age and living situation were not significant. As a consequence H6 was not supported.
Looking at the results of Table 14, it can be observed that beyond personal capabilities, also attitudinal factors and habits are significant, quite at the same level. However, contextual forces remain to be not significant. An explanation of this situation might be the fact that if we increase the number of the socio-demographic variables, then the ABC model variables become more significant, indicating that the social demographic aspect is not important compared to personal capabilities, attitudes and habits when we refer to the consumption of plant-based meat alternatives. Moreover, beyond the significant variables, there is one dummy variable having a p-value close to the acceptance: LS1 (living alone) with a p-value equal to 0,135. So, females, ageing between 21 and 25, living alone, might consume more frequently plant-based meat products with respect to females, ageing between 21 and 25, living with their parents. This is due to the fact that individuals take more independently decisions when they live alone and maybe they are more open to new types of food.

Analysing the hypotheses associated with barriers and concerns (from H7 to H8), I stated Equation 5[5] (paragraph 3.1). I didn't include in the equation the variables associated with the ABC model because I intended to analyse deeper each aspect and see how they influence the consumer's behaviour. Also, in this case, I used multiple regression analysis. Following the structure of Equation 4, I had one dependent variable (B - the behaviour of consuming plant-based meat alternative products) and nine independent variables: cultural barrier (CB) - question 9.16; information barrier (IB) - question 9.13; price barrier (PB) - question 9.6; taste barrier (TB) - reversed question 9.5; preparation difficulty barrier (PDB) - reversed question 9.7; food neophobia barrier (FNB) - question 9.15; environmental concerns (EC) - question 7; health concerns (HC) - question 8 and animal suffering concerns (ASC) - question 9.12.

To test the different hypotheses, I started by examining the assumptions of multiple regression. The Pearson Correlation Matrix was used to check the

[5] Equation 5: $B = B_1CB + B_2IB + B_3PB + B_4TB + B_5PDB + B_6FNB + B_7EC + B_8HC + B_9ASC$

multicollinearity of the data. The coefficients were ranging between -0,303 and 0,553, which showed no violation of the assumptions of perfect multicollinearity, and enabled a multiple regression analysis. In addition, the VIF for all the variables was below 10 and the Tolerance value was higher than 0,1 for all the variables. Two outliers were found as in the previous cases. The P-P Plot of regression standardised residual showed points close to the line and the scatterplot of the residuals showed 2 points exceeding the value of 3. In addition, there was a linear pattern indicating that the model is still not complete.

The independent variables of the Equation 5 explained 33,7% of the variance for B (behaviour of consuming plant-based meat alternative products). In fact, R^2 corresponds to 0,337 and the adjusted R^2 corresponds to 0,277. Moreover, the F test is significant, with a p-value less than 0,001. Hence, the equation fitted the data very well and Table 15 summarises the obtained results.

Table 15: Results from the regression analysis - Equation 5

Independent Variable	Unstandardised Coefficient		Standardised Coefficient Beta	t	P-value
	B	Standard error			
Cultural barrier	-0,058	0,044	-0,119	-1,322	0,189
Information barrier	-0,012	0,051	-0,020	-0,235	0,814
Price barrier	-0,033	0,065	-0,045	-0,503	0,616
Taste barrier	-0,268	0,064	-0,393	-4,205	<0,001
Preparation difficulty barrier	-0,138	0,070	-0,189	-1,961	0,053
Food neophobia barrier	-0,005	0,055	-0,008	-0,086	0,932
Environmental concerns	0,003	0,055	0,006	0,057	0,955
Health concerns	0,134	0,056	0,228	2,383	0,019
Animal suffering concerns	-0,011	0,058	-0,019	-0,183	0,855
			Observations		110
			R-squared		0,337
			Adj. R-squared		0,277
			F-statistics		5,649

H7 tested if the cultural barrier (CB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of CB was -0,119 (p=0,189), while the

Unstandardised Coefficient Beta of CB, corresponding to $B_{1,}$ was -0,058. So, if CB increased by 1 point, B would have decreased by 0,058. It showed that cultural barrier has a negative, but no significant impact on the behaviour of consuming plant-based meat alternative products. H7 was not supported.

H8 tested if the information barrier (IB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of IB was -0,020 (p=0,814), while the Unstandardised Coefficient Beta of IB, corresponding to $B_{2,}$ was -0,012. So, if IB increased by 1 point, B would have decreased by 0,012. It showed that the information barrier has a negative, but no significant impact on the behaviour of consuming plant-based meat alternative products. Also, H8 was not supported.

H9 tested if the price barrier (PB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of PB was -0,045 (p=0,616), while the Unstandardised Coefficient Beta of PB, corresponding to $B_{3,}$ was -0,033. So, if PB increased by 1 point, B would have decreased by 0,033. It showed that the price barrier has a negative, but no significant impact on the behaviour of consuming plant-based meat alternative products. Also, H9 was not supported.

H10 tested if the taste barrier (TB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of TB was -0,393 (p<0,001), while the Unstandardised Coefficient Beta of TB, corresponding to $B_{4,}$ was -0,268. So, if TB increased by 1 point, B would have decreased by 0,268. It showed that the taste barrier has a negative and significant impact on the behaviour of consuming plant-based meat alternative products. H10 was supported.

H11 tested if the preparation difficulty barrier (PDB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of PDB was -0,189 (p=0,053), while the Unstandardised Coefficient Beta of PDB, corresponding to $B_{5,}$ was -0,138. So, if PDB

increased by 1 point, B would have decreased by 0,138. It showed that the preparation difficulty barrier has a negative, being at the limit of significance, but with a tendency of no significance on the behaviour of consuming plant-based meat alternative products. H11 was not supported.

H12 tested if the food neophobia barrier (FNB) has a negative and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of FNB was -0,008 (p=0,932), while the Unstandardised Coefficient Beta of FNB, corresponding to $B_{6,}$ was -0,005. So, if FNB increased by 1 point, B would have decreased by 0,005. It showed that the food neophobia barrier has a negative, but no significant impact on the behaviour of consuming plant-based meat alternative products. H12 was not supported.

H13 tested if the environmental concerns (EC) associated with animal farming have a positive and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of EC was 0,006 (p=0,955), while the Unstandardised Coefficient Beta of EC, corresponding to $B_{7,}$ was 0,003. So, if EC increased by 1 point, B would have increased by 0,003. It showed that environmental concerns associated with animal farming have a positive, but not significant impact on the behaviour of consuming plant-based meat alternative products. H13 was not supported.

H14 tested if the health concerns (HC) associated with the consumption of traditional meat have a positive and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of HC was 0,228 (p=0,019), while the Unstandardised Coefficient Beta of HC, corresponding to $B_{8,}$ was 0,134. So, if HC increased by 1 point, B would have increased by 0,134. It showed that health concerns associated with the consumption of traditional meat have a positive and significant impact on the consumer's behaviour of consuming plant-based meat alternative products. H14 was supported.

H15 tested if the animal suffering concerns (ASC) associated with meat consumption have a positive and significant impact on the consumer's behaviour of consuming plant-based meat alternatives. The Standardised Coefficient Beta of ASC was -0,019 (p=0,855), while the Unstandardised Coefficient Beta of ASC, corresponding to $B_{9,}$ was -0,011. So, if ASC increased by 1 point, B would have decreased by 0,011. It showed that animal suffering concerns associated with meat consumption do not have a positive, nor a significant impact on the consumer's behaviour of consuming plant-based meat alternative products. H15 was not supported.

In conclusion of the analysis part, I can affirm that the results showed that all classifications were covered by respondents. Although not all the data distributions were balanced, it still regarded the 110 respondents as valid data for Italian consumers. All the regression equations reached statistical significance and Table 16 shows the summary of hypotheses results. Based on the analysis, in the following chapter, I will further discuss the results.

Table 16: Summary of hypotheses results

Hypotheses	Results
H1: Attitudinal factors positively affects B	Accepted
H2: Personal capabilities positively affects B	Accepted
H3: Contextual forces positively affects B	Accepted
H4: Resistance to change score positively affects B	Rejected
H5: Habits of buying traditional meat affect negatively B	Accepted
H6: Age, gender and living situation affects B	Rejected
H7: Cultural barrier negatively affects B	Rejected
H8: Information barrier negatively affects B	Rejected
H9: Price barrier negatively affects B	Rejected
H10: Taste barrier negatively affects B	Accepted
H11: Preparation difficulty barrier negatively affects B	Rejected
H12: Food neophobia barrier negatively affects B	Rejected
H13: Environmental concerns positively affect B	Rejected
H14: Health concerns positively affect B	Accepted
H15: Animal suffering concerns positively affect B	Rejected

Chapter 5. Conclusion

5.1. General observations

In this paragraph, I want to discuss the results of my analysis and highlight the main general observations. Through Equation 1, I discovered that the 3 variables of the ABC model (attitudinal factors, personal capabilities and contextual forces) fitted my research since all of them are statistically significant. In particular, personal capabilities is the best predictor of the behaviour of consuming plant-based meat alternative products. The components that are included in this variable are mainly knowledge about these products, such as general information, where to find them, how to prepare them and also respondents' affordability perception. The more people know about these products, the more they are likely to consume them. Also, the more affordable they are, the more people are likely to buy them. However, affordability is not the main component, respondents' knowledge about PBMAs is fundamental.

In addition, attitudinal factors related to plant-based meat are also very important. The components of this variable are animal care, sustainability, healthiness, easiness of preparation, tastiness, good feeling and future expectations associated with these products. The more people appreciate and value these aspects, the more they are likely to consume plant-based meat.

Furthermore, the variable representing the contextual forces is also statistically significant, but it is less important compared to personal capabilities and attitudinal factors. In my study, contextual forces are composed of occasions regarding when it is more appropriate to eat plant-based meat alternatives and the influence that close people have on the respondents (if family, friends or colleagues think the respondents should consume these products). From the general analysis (chapter 4.1), I want to highlight that the results show that respondents prefer to consume plant-based meat in informal contexts when they are eating with their family on a weekday, when they are eating alone or when they are invited to eat with friends. These results are interesting to me because I thought, people are likely to consume plant-based meat in public in order to draw attention and to show everyone that they care for the environment and for animals, while at home,

people are likely to eat what they like and enjoy more. However, the obtained results are consistent with the results obtained also in other studies (Fabienne M., et al., 2020).
Regarding the influence close people have on respondents, the results show that from the three groups, friends are most likely to think that respondents should consume plant-based meat. But, it seems that the friends' opinion is not so important to respondents compared to the family's opinion about food consumption.

Incorporating the last variable of the ABC model, habits, into the original equation, I obtained 2 questions based on two different points of view. Equation 2 takes into consideration the habits as the general predisposition to change, while Equation 3 takes into consideration the strength of the specific habit of buying traditional meat. Through Equation 2 I discovered that the general predisposition score of the respondents is not significant. Also, contextual forces are no more significant, but personal capabilities and attitudinal factors continue to be significant. I measured the resistance to change score by including 4 questions from the Oreg scale (Oreg, 2003) associated with routine seeking, emotional reaction, short-term thinking and cognitive rigidity. The higher the score is, the more respondents tend to resist, avoid changes and develop habits. In my sample, the highest score is represented by emotional reaction to imposed change, reflecting the amount of stress and uneasiness the individuals experience when confronted with imposed change. On the other hand, the lowest score is represented by routine seeking which represents the extent to which individuals enjoy and seek out stable and lasting routines in their lives. Comparing the score that I obtained with an international large sample, I can affirm that the respondents of my survey (Italians) seem to be slightly more resistant to change compared to the world population. In particular, the score is higher for the emotional reaction to imposed change and short-term thinking, while the score is lower compared to the world population for routine seeking and cognitive rigidity. Returning to the significance of this variable, I think that the reason for this result is the fact that the score is very wide and unspecific. Moreover, I think that the resistance to change is personal and cannot be a variable to describe a community at a country level.

Through Equation 3, I discovered that the specific habit of buying traditional meat is significant. I used questions from Self Reported Habit Index (SRHI) (Verplanken & Orbell, 2003) to measure the strength of this habit. In fact, the higher is the SRHI score related to buying traditional meat, the fewer people will consume plant-based meat alternatives. This fact is not surprising to me because plant-based meat alternatives are supposed to substitute traditional meat. In addition, in this equation, personal capabilities continue to be significant, but contextual forces and attitudinal factors are no more significant (attitudinal factors being at the limit of acceptance).

Returning to the theory of the ABC Model (Guagnano et al. 1995, Stern 2000), according to the specificity of the case object of analysis, the relevance of each variable can change. So, I can affirm that in the case of the consumption of plant-based meat alternatives, personal capabilities and habits related to buying traditional meat are the most important factors. This conclusion is not surprising to me, since the authors of the ABC Model affirm that, in general, green purchasing is mainly influenced by factors such as knowledge or skills (chapter 2.4).

Through Equation 5, I wanted to discover whether the social demographic variables, such as age, gender and living situation, are significant in the consumption of plant-based meat alternatives. The results show that these variables are not significant, which is a bit surprising in my opinion. I expected gender to be significant since in many studies females were more inclined to accept plant-based meat alternatives, in comparison with men. Also, I expected age to be significant since usually young people are more inclined to try new types of food and suffer less from food neophobia. Then, I thought also living situation could be important since many people live with their family, with their partners or with their roommates and this renders more difficult to take individual decisions related to the food consumption. However, to reinforce the obtained results, also from the general analysis (chapter 4.1) it can be observed that respondents do not perceive their living situation being a barrier when deciding what to consume.

In addition, the results of Equation 5 highlight that personal capabilities, attitudinal factors and habits are significant. However, contextual forces remain not to be significant. This observation puts in evidence the importance of ABC Model

variables compared to social-demographic variables indicating that the social demographic variables have little relevance.

By stating Equation 6, I tried to explore more about the barriers that prevent people from consuming plant-based meat alternatives and the concerns related to traditional meat that drive people to consume PBMA. In particular, the barriers that I examined are cultural, information, price, taste, preparation difficulty and food neophobia, while the concerns that I examined are environmental, health and animal suffering. The results show that the taste barrier was significant and also health concern was significant. An explanation of the taste barrier may be the fact that plant-based meat alternatives are not yet tasting exactly like meat. They try to mimic the flavour of meat, but it is highly difficult to obtain. As explained in the previous chapters (chapter 1.4), even researchers admit that despite all the techniques to mimic the flavour of the real meat, further studies in identifying meat-like aromas in PBMA products are needed (Kyriakopoulou, 2019). Referring to the taste, also in the general analysis (chapter 4.1), it emerged that some respondents who have never tried plant-based meat alternatives answered that these products are not tasty, while none of them considers PBMA to be tasty. This lead to the conclusion that there is a negative bias regarding the taste of these products, maybe due to the confusion between plant-based meat products and vegetarian products and possible bad previous experiences related to them.
The health concern associated with the consumption of traditional meat represents a driving force that contributes positively to the consumption of plant-based meat products. From my point of view, this result is surprising. I expected environmental concerns associated with global meat consumption to be more significant because nowadays the environmental topics are very common and widely discussed due to negative environmental effects. Also in the general analysis (chapter 4.1), it is evident that people are more concerned about environmental damage compared to health damage caused by animal farming and respectively by global meat consumption. However, the environmental concern does not have a significant impact on the consumption of plant-based meat products even though the majority of respondents think PBMAs are sustainable. An explanation of these results might be the fact that people do not act in accordance with what they know

and believe, probably due to the strength of the habit associated with buying traditional meat. Another explanation of my results, in particular of the importance of health concern, is the fact that people are more likely to think about their personal damage (their health) rather than general damage (environment). In fact, they could be more sensible to the topics and findings, such as processed meat being declared carcinogenic (Group1), red meat being a probable source of cancer (Group 2A) and correlations between high consumptions of processed and red meats and elevated mortality rates.

The purpose of my research is to understand the Italian consumer behaviour towards plant-based meat and to discover the driving factors and the barriers that influence the Italian consumers when it comes to consume these specific products. In a conclusion, I can affirm that Italians do not consume plant-based meat alternatives regularly. Almost all the respondents that participated in my survey have heard about plant-based meat alternatives, however only half of them have tried these products and only a few of them consume PBMA regularly. The main factors that influence this aspect are represented by personal capabilities (knowledge, skills and affordability) and the habit associated with the consumption of traditional meat. Also, attitudes associated with PBMA are important in certain cases, such as the values related to sustainability, healthiness, animal care and others. On the other hand, contextual forces, such as the occasions and opinions of close people, rarely have a significant impact on the consumption of plant-based meat but are certainly less important compared to personal capabilities and habits. In addition, analysing social-demographic variables, I can affirm that gender, age and living situation are not significant indicators of the consumers of plant-based meat alternatives. Regarding the main barrier that prevents consumers from consuming PBMA, results show that the taste barrier is very significant. In fact, by definition, plant-based meat alternatives try to mimic the original flavour of the meat. However, this process is very complex and scientists affirm there is room for improvement. Other reasons explaining why the taste barrier is so important might be due to high expectations by consumers and/ or negative biases created as a consequence of previous bad experiences related to vegetarian products. Furthermore, the results show that people consume

traditional meat regularly and the habit of buying is very strong despite environmental, health and animal suffering issues. Nevertheless, health concern associated with the consumption of traditional meat has a strong impact on the consumption of plant-based meat alternatives. This might be due to the fact that people are very sensitive when it comes to their health and recent studies regarding processed meat and red meat have increased their anxieties, but also their predisposition to try new healthier types of food.

5.2. Academic and managerial implications

This study contributes to academic research by exploring a quite recent topic. Plant-based meat alternative products are new on the market and researchers do not know what are the consumers' approach and behaviour towards these products. Moreover, my study adds value because it is focused on Italy and Italian consumers. It is important to make research in this field because we know that, in the future, people will have to adapt their diet due to the negative environmental effects of animal farming. Furthermore, for the first time, a complex and complete model including habits, such as the ABC model (Guagnano et al. 1995, Stern 2000) is applied to the topic of plant-based meat alternatives. The model fitted the data and every component was tested. In addition, social-demographic variables were tested and also possible barriers and concerns influencing consumers' behaviour led to important conclusions.

The study also offers new insights for companies trying to enter the Italian market or trying to improve their position in the Italian market with plant-based meat alternative products. The first factor which demonstrated to be very influential for consumers' behaviour was personal capabilities. This is why I think that companies should invest in diffusing more information about these products highlighting benefits associated with the environment, health and animal welfare. People should know more in order to try and buy more frequently. To reach more people, companies could invest in diffusing information online, through their sites, cooking blogs, social media and influencers. Moreover, people should know they can find these products in their favourite supermarkets and at restaurants. In particular, in

physical supermarkets, I recommend drawing attention by organising cooking demonstrations highlighting the easiness to prepare plant-based meat alternative products. Also, I think that tasting degustations can be helpful to attract consumers' attention. But, the main objective should be to diffuse information about ingredients, cooking preparation and benefits.

Attitudinal factors also are influential on consumers' behaviour. They include people norms, beliefs and values. Regarding this aspect, companies cannot impose specific norms and beliefs on the consumers but can guide them to discover more about environmental concerns related to the global consumption of traditional meat, health concerns and also animal suffering topics due to traditional farming. This can be linked to the previous aspect regarding the diffusion of more information. Moreover, companies operating in the sector of the plant-based meat market need to define their mission, vision and values aligning to global concerns and consumers' values and beliefs. In addition, they have to take consistent decisions fitted to their values. For instance, the package of plant-based meat alternatives should be eco friendly. Furthermore, other activities related to corporate social responsibility can be very important to the consumers.

Contextual forces are also significant, but less compared to other aspects. In general, they include interpersonal influences (persuasion, modelling); community expectations; advertising; government regulations and others. In my study, I focused on occasions and close people's influence. The results show that consumers prefer to eat plant-based meat in informal contexts when they are eating with their family on a weekday, when they are eating alone or when they are invited to eat with friends. That is why I suggest companies to continue making available these products in the supermarkets. Easy preparation and fast preparation is compatible with informal contexts. Restaurants can also propose plant-based meat to their customers, but not all restaurants are suitable. It could be more strategic to sell plant-based meat through restaurant chains and fast foods rather than luxury and expensive restaurants.

The habit of buying traditional meat influences very much the consumption of plant-based meat alternatives. Unfortunately, disrupting consumers' habits is difficult because they are used to take decisions automatically. Habits represent a big problem when it comes to marketing strategies because the individuals do not

seek nor process the information they see or receive. High investments in marketing activities can be useless. Nevertheless, there is a theory about how or when habits can be disrupted. The Habit Discontinuity Hypothesis (Verplanken et al. 2008) states that "behaviour change interventions may thus be more effective when delivered in the context of major habit disruptions, such as those related to life course changes". This happens because, on such occasions, individuals are more willing to search for further information about alternative courses of action, and are more open to making changes (chapter 2.4). Moreover, disruptions and context changes, at the same time, have relevant impacts also on people's values, attitudes and beliefs, making them more salient and people more attentive to them (Lanzini, 2018). That being said, an important aspect to take into consideration is the fact that nowadays online grocery shopping, which deliver food products directly home, are becoming more popular due to COVID pandemic conditions and due to increasing smart working tendency. Companies could take advantage of recent context disruptions in order to let consumers become familiar with plant-based meat alternatives. For instance, they could work in cooperation with supermarkets chains and send free sample products to consumers that make consistent and regular purchases. Moreover, the efficiency of this marketing strategy can be measured by monitoring the orders of consumers that already received free products. If they start to buy plant-based meat alternatives regularly, then the strategy can be considered efficient and more money should be invested in this activity.

Considering social-demographic variables, such as age, gender and living situation, results show that they do not have a significant impact on plant-based meat consumption. That is why, I suggest using gender-neutral packaging, without a specific focus on men or women. Moreover, older people should be targeted as well as younger people. Of course, young people could be easier targeted through digital devices, but old people could be targeted better in physical shops.

The result of the study show also that taste represents an influential variable that prevents consumers from buying or even trying plant-based meat alternative products. To overcome this barrier, companies need to transmit correct information clarifying that plant-based meat products are not the typical vegetarian or vegan products, avoiding negative bias for those persons that did not

even try products, but already affirm they do not like the taste. That is why it is needed a repositioning in the consumers' minds. Moreover, companies need to invest more to refine the flavour of plant-based meat because there is room for improvement. Plant-based meat is supposed to taste like real meat, however, when it is eaten as a single ingredient, the differences between the two types of meat are evident. But, in my opinion, when plant-based meat is combined with other ingredients, the overall flavour is very good. So, I suggest companies to try a strategy by offering meals including plant-based meat combined with other ingredients, rather than single products.

Furthermore, the results of my study show that health concerns associated with traditional meat are influential for the consumers when it comes to buy plant-based meat alternatives. That is why, I think, it is very important for companies to highlight, on the packaging (maybe through a QR code), the health benefits of consuming plant-based meat alternatives. People are very sensitive when it comes to their personal health and they will pay attention when companies or influential persons will address health issues.

5.3. Suggestions for future research and limitations

For future research, ABC Model should be rechecked by expanding the topics included in each variable. For instance, the contextual forces can be analysed including also advertising effects and government regulation effects. Moreover, it could be interesting to study whether monetary inducements and non-monetary incentives have a positive influence on the consumption of plant-based meat alternatives. Furthermore, to make more significant conclusions, the habit variable could be rechecked by including habits associated with other pro-environmental behaviours. In this way, there can be discovered interrelated behaviours that create spillover effects. Adopting an environmentally behaviour in one domain could spill over in different environmental domains leading to the ideation of new efficient strategies. Moreover, I think that after some time, people will consume plant-based meat regularly and then I suggest reapplying the ABC Model in a questionnaire to see how the significance of each variable changed.

I suggest also testing other social demographic variables to see whether there are some of them having a significant impact on the consumption of plant-based meat alternatives. In addition, other barriers, beyond those tested in this study, should be identified and analysed.
Other areas for future research are represented by the media. In particular, studies should be done to analyse how the media talks about plant-based foods and how it influences people. Also, studies should be conducted to see how do the prejudices about vegans and vegetarians influence people's attitudes toward plant-based meat alternatives. Additionally, research should be done including cognitive dissonance aspects, such as understanding why people say they love animals, but at the same time, they eat them. There are many more aspects to take into consideration when analysing plant-based meat alternative products, like what kind of message, including wording, could be more appealing to Italian consumers to make them introduce meat alternatives in their routine. Moreover, organising focus groups and conducting interviews could bring also qualitative information useful to understand consumers' feelings and behaviours.

As previously mentioned, there are some limitations to the generalisation of this study (chapter 3.3). First, the problem with few respondents is that a few outliers can immediately affect the normality analysis. Moreover, this topic is quite new for Italian society rendering it more difficult to study and to obtain normalised results.
Furthermore, an issue is that the population is not representative of Italian society, so even though the study is valid, it cannot be generalised (for example, many of the respondents were females, having between 21 and 25 years). Moreover, this topic might have attracted people that already have a vegetarian or a vegan diet, or that have already tried plant-based meat alternatives and wanted to express their satisfaction or dissatisfaction regarding these types of products.

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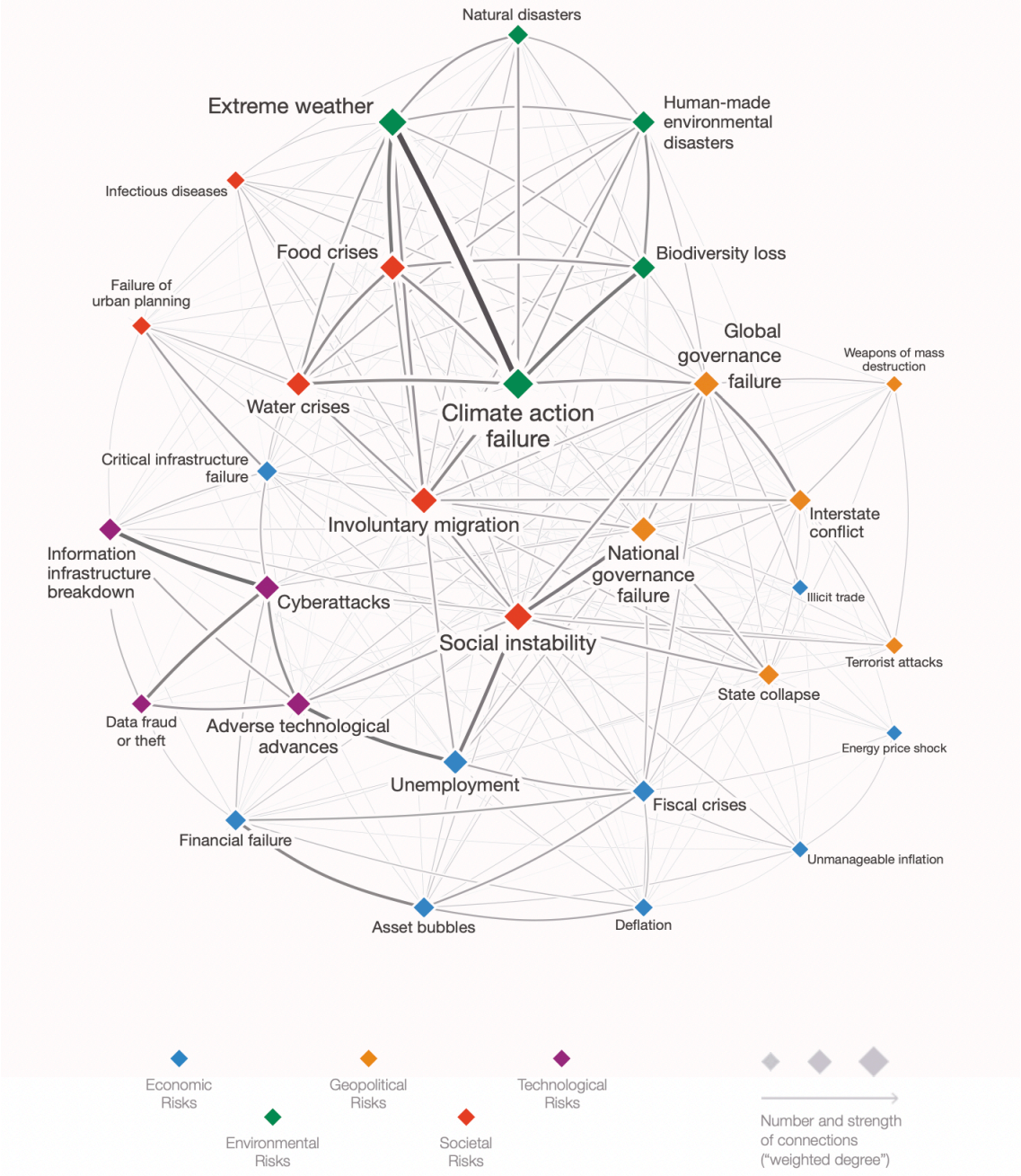
Appendix

Appendix 1

Appendix 2

Figure IV: The Global Risks Interconnections Map 2020



Appendix 3: Questionnaire

Sondaggio sulla carne “plant-based"

La carne vegetale, anche detta "plant-based meat" è la carne che imita il gusto, l'aspetto, la consistenza e il profumo della carne tradizionale, ma è fatta di ingredienti vegetali. In commercio si trova sotto forma di hamburger, salsicce, polpette e altro. Principalmente, le proteine della carne vegetale derivano dalla soia, dai piselli, dai fagioli indiani, etc. Non è da confondere con altri prodotti vegetariani o vegani.

Rispondendo alle domande del questionario, da il suo consenso alla partecipazione per lo studio. Il questionario è anonimo.

Il sondaggio dura circa 10 minuti e sarà attivo fino al 30 Novembre.

In caso di ulteriori chiarimenti, può contattarmi a questo indirizzo email: 861853@stud.unive.it

La ringrazio per la partecipazione.

Numero	Domanda	Opzioni di risposta
Domanda 1	La tua dieta è prevalentemente: (Solo una possibilità di risposta)	◉ Onnivora ◉ Carnivora ◉ Vegetariana ◉ Vegana ◉ Altro…
Domanda 2	Quanto spesso hai sentito della carne vegetale (plant-based meat)?	Likert scale da 1 a 5 (Da “mai” a “molto spesso”)
Domanda 3	Hai mai provato la carne vegetale? (Solo una possibilità di risposta)	◉ Si ◉ No
Domanda 4	Quanto spesso consumi la carne normale in media al mese?	Likert scale da 1 a 5 (Da “mai” a “ogni giorno”)
Domanda 5	Quanto spesso consumi la carne vegetale in media al mese?	Likert scale da 1 a 5 (Da “mai” a “ogni giorno”)
Domanda 6	Quando spesso pensi di consumare la carne vegetale nel futuro?	Likert scale da 1 a 5 (Da “mai” a “ogni giorno”)
Domanda 7	Quanto dannoso pensi che l'allevamento sia per l'ambiente?	Likert scale da 1 a 5 (Da “per niente” a “molto”)
Domanda 8	Quanto dannosa pensi che la carne sia per la salute?	Likert scale da 1 a 5 (Da “per niente” a “molto”)

Numero	Domanda	Opzioni di risposta
Domanda 9	Valuta le seguenti affermazioni:	Likert scale da 1 a 5 per ogni domanda (1-“fortemente disaccordo”; 2 -“disaccordo”; 3 -“non so”; 4 -“d’accordo”; 5 -“fortemente d’accordo”)
9.1	Non sapevo dell'esistenza della carne vegetale;	
9.2	Non so dove trovare la carne vegetale;	
9.3	Non conosco molto sulla carne vegetale;	
9.4	Non so come preparare la carne vegetale;	
	La carne vegetale è buona di gusto;	
9.5	La carne vegetale è troppo costosa;	
9.6	La carne vegetale è facile da cucinare;	
9.7	La carne vegetale è sostenibile;	
9.8	La carne vegetale fa bene alla salute;	
9.9	Se la carne vegetale costasse meno della	
9.10	carne normale la comprerei di sicuro;	
	Mi sento bene con me stesso/a quando	
9.11	consumo la carne vegetale;	
	Il largo consumo della carne vegetale	
9.12	renderebbe migliore la vita degli animali;	
	È difficile trovare informazioni sulla carne vegetale;	
9.13	Vivo con altre persone e non posso decidere liberamente cosa consumare;	
9.14	Non mi piace provare nuove tipologie di cibo;	
9.15	Valorizzo l’aspetto culturale e tradizionale del cibo.	
9.16		
Domanda 10	Valuta quanto è appropriato mangiare la carne vegetale in queste occasioni:	Likert scale from 1 to 5 for every subquestion (1-“per niente appropriato; 2 -“non appropriato”; 3 -“indifferente”; 4 -“appropriato”; 5 -“molto appropriato”)
10.1	Stai mangiando da solo/a;	
10.2	Sei stato invitato a mangiare con gli amici;	
	Stai mangiando con la famiglia in un giorno	
10.3	normale della settimana;	
	Stai mangiando con la famiglia in un giorno	
10.4	di festa;	
	Sei stato invitato a cena in un ristorante;	
10.5	Sei ad un pranzo di lavoro.	
10.6		
Domanda 11	Valuta queste affermazioni:	Likert scale da 1 a 5 per ogni domanda (1-“fortemente disaccordo”; 2 -“disaccordo”; 3 -“non so”; 4 -“d’accordo”; 5 -“fortemente d’accordo”)
11.1	I miei amici ritengono che dovrei consumare la carne vegetale;	
11.2	Quello che pensano i miei amici del mio consumo alimentare è importante per me;	
	La mia famiglia ritiene che dovrei	
11.3	consumare la carne vegetale;	
	Quello che la mia famiglia pensa del mio	
11.4	consumo alimentare è importante per me;	
	I miei colleghi/compagni ritengono che dovrei consumare la carne vegetale;	
11.5	Quello che i miei colleghi/compagni pensano del mio consumo alimentare è	
11.6	importante per me.	

Numero	Domanda	Opzioni di risposta
Domanda 12 12.1 12.2 12.3 12.4	Valuta queste affermazioni: Preferisco fare le solite cose al posto di provarne altre nuove e diverse; Se venissi informato che al lavoro ci saranno dei cambiamenti importanti, sarei molto stressato; A volte mi trovo ad evitare i cambiamenti che potrebbero essere positivi per me; Non cambio le mie idee facilmente.	Likert scale da 1 a 5 per ogni domanda (1-"fortemente disaccordo"; 2 -"disaccordo"; 3 -"non so"; 4 -"d'accordo"; 5 -"fortemente d'accordo")
Domanda 13 13.1 13.2 13.3 13.4 13.5 13.6 13.7 13.8 13.9 13.10 13.11 13.12	Consumare la carne tradizionale è qualcosa che: Faccio spesso; Faccio automaticamente; Faccio senza dover ricordarlo coscientemente; Mi fa sentire strano se non lo faccio; Faccio senza pensarci; Richiederebbe sforzo non farlo; Appartiene alla mia routine giornaliera, settimanale o mensile; Inizio fare ancora prima di realizzare che lo sto facendo; Faccio fatica a non farlo; Non ho bisogno di pensare se farlo o meno; È tipicamente da me; Ho sempre fatto da tanto tempo.	Likert scale da 1 a 5 per ogni domanda (1-"fortemente disaccordo"; 2 -"disaccordo"; 3 -"non so"; 4 -"d'accordo"; 5 -"fortemente d'accordo")
Domanda 14 14.1 14.2 14.3 14.4 14.5 14.6 14.7 14.8 14.9 14.10 14.11 14.12	Comprare la carne tradizionale è qualcosa che: Faccio spesso; Faccio automaticamente; Faccio senza dover ricordarlo coscientemente; Mi fa sentire strano se non lo faccio; Faccio senza pensarci; Richiederebbe sforzo non farlo; Appartiene alla mia routine giornaliera, settimanale o mensile; Inizio fare ancora prima di realizzare che lo sto facendo; Faccio fatica a non farlo; Non ho bisogno di pensare se farlo o meno; È tipicamente da me; Ho sempre fatto da tanto tempo.	Likert scale da 1 a 5 per ogni domanda (1-"fortemente disaccordo"; 2 -"disaccordo"; 3 -"non so"; 4 -"d'accordo"; 5 -"fortemente d'accordo")
Domanda 15	Attualmente vivi in Italia? (Solo una possibilità di risposta)	◉ Si ◉ No
Domanda 16	Di che genere sei? (Solo una possibilità di risposta)	◉ Femminile ◉ Maschile ◉ Altro ◉ Preferisco non rispondere

Numero	Domanda	Opzioni di risposta
Domanda 17	Quanti anni hai? (Solo una possibilità di risposta)	◉ Fino a 16 ◉ Da 17 a 20 ◉ Da 21 a 25 ◉ Da 26 a 30 ◉ Da 31 a 40 ◉ Da 41 a 60 ◉ Più di 60
Domanda 18	Quale è la tua occupazione? (Solo una possibilità di risposta)	◉ Studente ◉ Lavoratore ◉ Disoccupato ◉ Pensionato ◉ Altro…
Domanda 19	Al momento abiti: (Solo una possibilità di risposta)	◉ Da solo/a ◉ Con il tuo partner ◉ Con il tuo partner e i tuoi figli ◉ Con i tuoi figli e sei genitore single ◉ Con i tuoi genitori ◉ Con altri coinquilini
Domanda 20	Educazione: (Solo una possibilità di risposta)	◉ Diploma scuola superiore ◉ Laurea triennale ◉ Laurea magistrale ◉ Master ◉ Preferisco non rispondere
Domanda 21	Quanto guadagni in media al mese? (Solo una possibilità di risposta)	◉ Non ho guadagni propri ◉ Tra 500 e 1000 euro ◉ Tra 1000 e 2000 euro ◉ Tra 2000 e 3000 euro ◉ Tra 3000 e 4000 euro ◉ Più di 4000 euro
Domanda 22	Quanto spendi settimanalmente per il cibo solo per te stesso (inclusi pranzi e cene fuori? (Solo una possibilità di risposta)	◉ Non ho spese proprie ◉ Fino a 50 euro ◉ Tra 50 e 100 euro ◉ Tra 100 e 200 euro ◉ Tra 300 e 400 euro ◉ Tra 400 e 500 euro ◉ Più di 500 euro