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Sustainable Protein Transitions: Attitudes of Different Consumer Groups towards Plant-Based Meat Analogues in the United Kingdom

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No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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ABSTRACT OF THESIS submitted by: Devisha PODDAR for the degree of Master of Science and entitled: Sustainable Protein Transitions: Attitudes of Different Consumer Groups towards Plant-based Meat Analogues in the UK

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Novel plant-based meat alternatives claim to offer the meat experience without meat. Plant-based meat alternative companies contend that their products are healthier and have a lower environmental impact in comparison to real meat, although early studies have contrasting arguments about consumer attitudes to these products. In this thesis, I conducted surveys and online interviews with consumer groups in the UK (based on dietary preferences) pertaining to their opinions on plant-based meat alternatives. Building on Appadurai's scapes and the concept of foodscapes, the Alternative Meatscape is crafted as a conceptual framework unique to this study. The main themes examined are sensory experiences, impact on demand for meat, and priorities and trade-offs pertaining to consumer values related to plant-based meat alternatives. The results reveal that different consumer groups have varying ideas, expectations and requirements from meat analogues. Even though meat consumption is far from being eliminated, I argue that in order to encourage a larger transition to plant-based meat alternatives, companies need to address the heterogeneity in attitudes and preferences of consumer groups to create a range of plant-based food products with diverse properties.

Keywords: plant-based meat alternatives, sensory experience, priorities, trade-offs, vegan, vegetarian, flexitarian, omnivore, heavy meat eater, the UK.

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1. Introduction

There has been increasing evidence of a correlation between the decline of environmental health of the planet and production and consumption of food, leading to the need for an urgent push for consumers towards sustainable diets. Transitioning to a healthy diet has a positive and direct impact for the United Nations Sustainable Development Goals. Further, FAO states that sustainable diets should be affordable, acceptable as well as be healthy, nutritious and have a low environmental impact. However, food choices are complex and are determined by multiple factors such as geographical, socio-economic, business strategies combined with local, regional and governmental policies (Grave et al. 2020).

Meat production is one of the primary drivers for environmental change and resource depletion, it occupies 40% of agricultural land globally, accounts for 29% of agricultural freshwater use and 14.5% of greenhouse gases. There is an urgent need arising from agreement among scientific, environmental and public health communities regarding a shift to more sustainable proteins. Preliminary studies highlight that novel plant-based meat alternatives can be crucial in meeting the current and future demand of meat in EU, concurrently they can reduce emissions and reduce land use from agriculture and make land available for carbon capture and renewable energy production (Froggatt and Wellesley 2019). Since 1960s, mock meat has been popular in Southeast Asia in the form of fermented soy cakes such as tofu or tempeh. (Ismail et al. 2020). However, meat replacements that emerged in the global North between early to mid-1900s, focused on appeasing vegans and vegetarians and were not compulsorily designed to mimic meat. Some of the initial products including tofu, tempeh, and others such as vegetable/rice based burgers and patties and even seitan. More recently, plant-based sausages, chicken-free nuggets, meat-free mince, vegan bacon or plant-based meat alternative patties are some of the novel products available in the market (Olyanju 2019). They are different from well-known or older meat alternative brands or products such as Quorn or tofu, as they are aimed at meat-eaters, omnivores or flexitarians rather than vegans or vegetarians. As per novel plant-based meat alternative companies, their design offers an extraordinary similarity to meat that allows consumers to continue enjoying the sensory experience of meat (Froggatt and Wellesley 2019). For instance, Impossible Foods

have a plant-based meat replacement patty that offers a meaty experience along with an iron taste and oozing blood-like juice. The brand uses engineered yeast to replicate the heme molecules that gives meat its appearance and blood its red colour (Troitino 2016).

In the 21st century, meat analogues are in the limelight and have received high investments for R&D in the US, Europe, the UK, Israel and India (Froggatt and Wellesley 2019). The UK presents an interesting case as the sustainability of diets has already been questioned. Moreover, the UK is in process of developing a National Food Strategy based on human and environmental health. Unfortunately, there is a dearth of relevant, high quality data for assessing environmental, health and socio-economic impact of current diets. Moreover, datasets lack information pertaining to household attitudes or perceptions of sustainability of food consumption or purchasing patterns to understand why consumers make changes in their diets (Grave et al. 2020).

Recent research suggests that vegetarians and non-vegetarians are aware of the reduced environmental implications of a non-meat/vegetarian diet in the UK. Life Cycle Assessments of well-known plant based meat alternatives conclude that they are significantly less emissions intensive in comparison to conventional meat (Froggatt and Wellesley 2019). The latest plant based meat alternatives are designed to mimic meat and offer consumers a meat-like experience of taste, texture and smell, while, some consumers have raised concerns regarding overprocessing, high sodium content and GMO use. Bryant (2019) states that another category of consumers that have emerged are flexitarians or those who are trying to reduce their meat consumption. Olyanju (2019) claims that plant-based meat replacement companies are recreating the meat experience for flexitarians, whom they assume to be their largest consumer base, although scientific research on flexitarians as a group is lacking. Further, not only are flexitarians known to be a fickle group, but plant-based meat companies should consider relevance of other consumer groups that are already consuming these products as well as encourage transitions for groups that have a larger proportion of meat in their diets.

1.1 Research Problem

Plant-based meat alternatives have been in the UK since 1985 (Hoek et al. 2011), newer brands such as Moving Mountains, Impossible Foods and Beyond Meat have emerged in the last few years. The difference between them is that novel brands want to cater to meat-eaters and meat believers rather than vegetarians and vegans. However, there is a reluctance for

meat-eaters to shift to plant-based meat replacements and different target groups have different sensory expectations and ethical concerns and priorities that lead to their dietary preferences. Further, they may have conflicting or varying priorities, all of which is not possibly addressed by one type of product.

This study differentiates customers on the basis of dietary preferences and meat consumption. Rather than focusing only on attitudes of flexitarians, omnivores or heavy meat eaters, regarding novel plant-based meat alternatives it also examines the attitudes of vegans and vegetarians and those with ultra-processed diets. This study provides a holistic view on attitudes of different consumer groups pertaining to plant-based meat alternatives that cater to not only vegetarians and vegans but also that are meant for meat eaters in the UK. In other words, it studies attitudes of consumer groups regarding older brands and products such as Quorn or Linda McCartney or seitan/tofu and novel brands such as Moving Mountains, Impossible Foods and Beyond Meat.

In terms of themes the study analyses sensory experiences, impact on demand for meat, and priorities and trade-offs pertaining to consumer perceptions related to plant-based meat alternatives. The conceptual framework of 'Alternative Meatscapes' draws upon Appadurai's scapes, foodscapes and meatscape. It is an asymmetrical passage that combines multiple factors coalesce to create imagined realities and discourses that determines the behaviour of consumers. In this study, the behaviour of different consumer groups towards plant-based meat alternatives in the UK.

1.2 Research Questions

The purpose of this thesis is to examine how different consumer groups perceive plant-based meat alternatives in the UK, how consumers groups value sensory experiences, their relationship with meat and ecological sustainability. How do various factors such as taste, environmental impact, social influence, price or a combination of various factors motivate consumer choices?

This study aims to answer the following questions:
Research Question 1: How do different consumer groups perceive sensory experiences and expectations of eating plant-based meat alternatives?

Research Question 2: How do different consumer groups perceive plant-based meat substitutes and their relationship to meat?
Research Question 3: How do different consumer groups prioritize factors and identify trade-offs while consuming plant-based meat alternatives?

The next chapter provides a literature review regarding plant-based based meat alternatives and consumer perspectives in the UK. It is followed by the conceptual and theoretical framework as the third chapter that introduces and discusses 'Alternative meatscape', while the fourth chapter discusses the methodology used for the analysis for this thesis. The next three chapters, chapters five, six and seven present the results regarding sensory experiences, demand for plant-based meat and priorities and trade-offs of different consumer groups towards plant-based meat alternatives, the last chapter presents the conclusion.

2. Literature Review

Global meat consumption has been on the rise with the increase in two significant factors, global population and disposable incomes. Western diets have predominantly included meat proportions that are higher than daily recommendations. Apostolidis and McLeay (2016), state that meat holds a special status and is considered to be indispensable to health the global North. In 2018, meat production for the US was 46.83 million tonnes, for Germany it was 8.19 million tonnes, for the UK it was 4.09 million tonnes and 2.94 million tonnes for Netherlands (Ritchie and Roser 2017). Nevertheless, these countries have identified that reduction in meat consumption for consumers reduces pressure on public health, environment and society (Apostolidis and McLeay 2016).

A critical challenge faced by humans is to feed nine billion people by 2050. Studies predict that there are grave results for the environment, nature, landscape as well as food security unless there is a transition from animal based protein consumption to sustainable plant based diets. However, environmental experts are unconvinced about relying solely on innovative technologies and efficient methods to remedy food security or issues pertaining to livestock farming (Bakker and Dagevos 2012). Broad (2019) states that meat alternatives have been criticized by primarily two sets of groups; one, proponents of industrial animal based farming who claim that factory farming has been misunderstood. Apparently, it is efficient, well designed, innovative and essential for producing nutritionally dense protein to feed the population. Second, advocates of holistic farm management and agroecologists propose integrating animals into closed loop nutrient recycling on farms. The author also argues that the latter are opposed to factory farming, though they insist that bovine animals can be key to carbon sequestration through managed grazing and can in parallel reduce impact on climate change, offer adequate animal protein and maintain traditional ways of farming.

In the opinion of the researcher as well the author, Broad (2019) states that factory farming or industrial animal food production is polluting and unsustainable, whereas small scale animal food production lacks capacity. Even though Life Cycle Assessment of animal agriculture's impact on climate change is inconsistent, enteric fermentation from livestock produced approximately 87% of methane emissions in 2016 in the UK (Crown 2016). Production of animal feed, land use and deforestation are far more detrimental than plant-based products.

For comparison, 1kg of beef emits 60 kgs of greenhouse gases equivalent to carbon dioxide, while 1kg of peas emit only 1 kg of greenhouse gases (Ritchie 2020). Broad (2019) also states that industrial animal food production has been related to foodborne illnesses, pandemic influenza and resistance to antibiotics. Moreover, a widely discussed but contested opinion regarding meat consumption is its risk to diet related chronic diseases such as diabetes, obesity, cardiovascular disease and some forms of cancer, research suggests that perhaps plant based diets can be a preventive measure and improve health. However, the health effects of meat in comparison to plant-based meat alternatives are still unknown.

2.1 What are plant based meat substitutes?

Meat alternatives are made using plant proteins from pulses such as peas or soybean, cereal protein, fungi (Hoek et al. 2011), algae, dairy products (e.g. Valess) or mycoprotein (e.g. Quorn). They are available as burger patties, stir fry cubes, or mincemeat and more and they mimic the texture and taste of meat (Broad 2019). Meat alternatives have a smaller footprint in comparison to meat products[1] and consume less water[2], while sodium levels vary[3]. Although, plant based meat substitutes are more expensive than meat products, the novel brands that are akin to meat are three to four times the price of meat. However, they are meant to cater to the ethical and health standards of consumers (Apostolidis and McLeay 2016). Qualities such as freshness, convenience, sensory attributes, and others such as healthiness of the product are important for consumers (Hoek et al. 2011).

The novel plant-based meat alternative brands use state-of-the-art technology in food science, big data, and flavour technology to create products for meat eaters who are trying to reduce their environmental footprint. Leading brands such as Beyond Burger and Impossible Burger are aimed at omnivores and have largely been accepted in retail, restaurants and fast food chains, they also place their products next to the meat section in supermarkets such as Tesco in the UK (Apostolidis and McLeay 2016).

[1] Raw material for plant-based meat alternatives such as cereals and legumes and seeds produce carbon dioxide equivalents of 1.38kg, 2.46kg and 2.09kg respectively. While, chicken 9.98kgs pork produces 10.25 kgs and beef produces 37 – 42 kgs of carbon dioxide equivalents of gases in EU (Clune et al. 2017).

[2] Water use or consumption for plant-based meat analogues is 3800 litres/kg while for a beef burger is 8400 litres/kg and for a chicken sausage patty is 8000 litres/kg (Fresan et al. 2019).

[3] Sodium in plant-based mince was approximately six times higher than the sodium of meat mince, however the reverse was true for sausages, where meat sausages contained 66% more than the plant-based sausages (Curtain and Grafeneur 2019).

2.2 Meating in the UK: The meat consumption and meat analogue scenario

Plant based meat substitutes are also known as meat replacers or meat analogues, these terms have been used interchangeably in this study. The meat analogue market in the UK is considered to be the most developed in the world. Quorn was first introduced in the UK and only five years later in other Western countries. Linda McCartney is another leading brand of meat replacers in the UK from early 1990s. While, meat intensive diets have received criticism due to ethical, environmental and social reasons, alternate protein sources or plant based meat analogues have received a healthy status, although controversial, among some consumer groups and could be a key factor in reducing meat consumption (Hoek et al. 2011).

Ground meat or minced meat is the most commonly purchased meat in the UK; it has a relatively low price and is available in different varieties including plant based meat substitutes. Minced beef accounts for 37% of beef retail expenditure, similarly, meat free mince is the most popular product in the meat substitute market. The health department in the UK reports that meat consumption needs to reduce by 70%, i.e. from 226 g/daily for men and 163 g/daily for women to 70 g/daily to meet health standards (Apostolidis and McLeay 2016).

The authors present consumer preferences for meat and meat substitutes and create customer segmentation based on these inclinations in the UK. They highlight that primary factors that influence consumer choices of meat or meat analogues are type of mince, fat percentage, place of origin and price, whereas secondary factors include carbon footprint, production techniques and brand name (Apostolidis and McLeay 2016). People in the UK who rarely used meat alternatives would prefer a product that resembles meat in textures, taste, smell and appearance, while heavy users of plant alternatives, preferred a product that is not that similar to meat (Hoek et al 2011).

Novel meat analogues are meant for meat eaters and for people trying to avoid meat for ethical or environmental reasons. For heavy meat alternative consumers, meat is more familiar than meat analogues in Western countries. More inputs regarding product development and promotion strategies are required as well as perceptions regarding barriers and drivers for different consumer groups to adopt this product (Hoek et al. 2011).

2.3 Ethics of meat consumption

From a global outlook, wealthier nations are responsible for environmental degradation and should redress animal consumption. The poorer countries are more vulnerable and bound to suffer from environmental degradation and are at a higher risk for food security. Bakker and Dagevos (2012) also state that the environment, future generations and other human beings are other reasons why meat consumption should be reduced. Another school of thought, recommends purchase of meat from production chains with high standards of animal welfare. Only a small minority of consumers are able to adopt truly sustainable food styles, as ethical arguments are often ignored or forgotten during food purchasing. Decisions of buying are influenced by many variables such as emotions, social norms, perceptions, convenience, certainty, values and routines and it is a challenge to address the varied motivations (Bakker and Dagevos 2012).

2.4 Future outlook

Strategies and policies aimed at reducing meat consumption include nutritional labelling, access to ample information, monetary incentives, educational campaigns and new product development will be more effective if they are channelled towards particular target groups rather than average consumers (Apostolidis and McLeay 2016). Bakker and Dagevos (2012) also argue that flexitarians, a group of meat eaters who want to reduce their meat consumption due to environmental or ethical reasons, has not been recognized enough in scientific research nor have they received attention in policies for sustainable consumption. However, flexitarians are not a homogeneous group and hence policies to address this group needs to comprise of varied strategies that incorporate different eating habits and different motives.

The UK is a leader in nutritional labelling on food packaging and this strategy is recommended to influence consumers to a more sustainable meat consumption pattern. Less but better meat and meat less days have been advocated to reduce meat consumption (Apostolidis and McLeay 2016). Moreover, to make plant based substitutes more attractive for meat eaters, Hoek et al. (2011) it is recommended that the substitutes should be made especially to resemble meat and should have better sensory attraction rather than communication of ethical arguments. Moreover, the introduction of a livestock based carbon tax can in combination with better availability of meat alternatives would reduce meat consumption (Slade 2018).

2.5 Strategies for protein transition

Hybrid meat substitutes (Apostolidis and McLeay 2016) is a sustainability by stealth strategy that comprises of products that are part meat and part plant based. Sustainability by stealth is built on the premise that consumers are not logical and are driven by emotions, values and rewards, rather than highlighting the sustainability angle of a product, it focuses on marketing priorities of consumers, perhaps health or fat content for food products. For example: these sustainable food innovations are not very noticeable and are marketed for their lean or low fat content rather than their reduced environmental impact. Although, this might be successful in obtaining consumer's attention, there could be contention regarding the 'meat-like' nature of the products is unnatural or consumers are being misled (Bakker and Dagevos 2012).

Introduction of meat free days/meals (Pohjolainen et al. 2015), can lead to consumers being more actively involved and target those who care about food systems. These campaigns could be supported by NGOs or market organizations to reduce meat portions or consistent meat free days. Producers or plant based meat substitute companies have introduced meal concepts, which is culturally more aligned to the food habits of heavy meat eaters and omnivores (Bakker and Dagevos 2012).

Another group of consumers are food citizens who are aware and have political and ethical motives, their ideologies match with organic meat. Their meat consumption is next to negligible and their food choices are based on animal welfare, production methods and the environment. The Slow Food Movement is an example where a lifestyle change is dominant (Bakker and Dagevos 2012).

2.6 Challenges

Some animal activists are concerned that plant based meat in the pre-existing supply chains might increase the life of industrial animal meat industry. Activists argue that use of GM and highly processed nature of plant based food alternatives raise questions of health and food safety. They are sceptical that given the current food supply chain, in the future plant based meat alternatives will become nutritionally inadequate yet affordable, and environmental factors and community will be overshadowed by capitalism. Regarding environmental sustainability, raw materials for plant based meat substitutes are not, but could be more dependent on petro-chemical inputs and conventional mono-cropping farming systems or be

entrenched in diverse and regionally suitable regenerative agriculture (Broad 2019). Moreover, from a nutritional perspective, plant based meat would require intensive food safety testing and a further push to improve nutritional profiles.

2.7 Why do meat alternatives have a low level of acceptance?

A considerable number of consumers from the wealthy nations are of the opinion that favourable action must be taken towards the environment and animal welfare issues of modern livestock industry, however consumers have inconsistent behaviour (Bakker and Dagevos 2012). Although, some consumers associate meat alternatives with food neophobia, and perceive them to be of lower quality and have lower healthiness of product, while they are more expensive in comparison to meat (Apostolidis and McLeay 2016, Hoek et al. 2011). Significant barriers for non-users and light/medium users are lack of familiarity and unsatisfactory sensory similarity to meat (Hoek et al. 2011). Even though, consumers might consider environmental impact or animal welfare as priorities, other factors such as price led to inconsistencies in consumer ideologies and behaviours or in other words consumers had conflicting priorities that often lead to trade-offs (Farrow and Georgieva 2016).

Cultural factors play an important role in consumer preferences regarding options of meat or plant based food. It is useful to note that consumer attitudes are not fixed and can be changed with marketing campaigns or social norms - by increasing environmental consciousness or making consumers aware of the environmental impact of meat production (Slade 2018, Elzerman et al. 2011). Moreover, consumers are influenced by social factors such as dietary patterns or ideologies of household members or might choose a particular diet based on their partner's preferences or even on the basis of children's fondness of food items (Higgs and Thomas 2016).

In addition to the measurement parameters from studies above, frequency of meat consumption is also an important factor. Some barriers observed in Finland with shift to plant based diets include relishing of meat, ideas about health, meal routines and unfamiliarity with vegetarian meal preparation (Pohjolainen et al. 2015).

In conclusion, this literature review offers a holistic background on the emergence of plant-based meat alternatives in the global North. It defines plant-based meat alternatives and compares its environmental impact with that of meat. It discusses the introduction of Quorn in

the UK in the 1980s as well more recent brands such as Impossible Burger and Beyond Meat. The chapter also focuses on ethics of meat consumption, the future of the protein transition, strategies for plant-based meat alternatives, challenges and the low acceptance rate of the meat analogues.

The review also presents factors such as convenience, sensory attributes and healthiness that have been highlighted previously by consumer attitudes. Some studies claim that plant-based meat alternatives have received a healthy status pertaining to consumer perspectives. However, it might not be the perspective of all consumers.

Based on Apostolidis and McLeay (2016) this study creates customer segmentation or groups based on their dietary preferences including vegan, vegetarian, flexitarian, omnivore, heavy meat eater and a group who ate mainly ultra-processed foods. The different brands of plant-based meat alternatives that consumers have tried. Which aspects of plant-based meat alternatives are consumers attracted to? Ranging from ethical, environmental, social influence, sensory experiences, value of product, convenience and more.

The next chapter concentrates on the theoretical and conceptual framework used in this study to understand the attitudes of different consumer groups towards plant-based meat analogues in the UK.

3. Conceptual and Theoretical Framework

The plant-based meat analogue industry claims that their product line is manufactured to allow "consumers to enjoy the taste of meat at the fraction of the environment cost" (The Good Food Institute, 2019). This chapter creates an 'alternative meatscape' by drawing on literatures of ethical consumerism, foodscapes and meatscapes that arise within the discourse of plant-based meat alternatives. It combines the aforementioned concepts to formulate a unique framework essential for this study and to examine plant-based meat alternatives. It further discusses how alternative meatscapes will be used to answer the research questions, to analyse attitudes of different consumer groups regarding plant-based meat alternatives related to sensory experiences, perceptions regarding the product's affinity to meat, impact on demand for meat ,animal welfare, carbon footprint and priorities and trade-offs pertaining to the factors associated with the plant-based meat alternative industry.

3.1 Ethical Consumerism

In an ecologically interdependent world, people from the global North act out of self-interest when they care about distant strangers in the global South and ethical consumerism can accommodate these acts of self-interest (Morgan 2010). Similarly, when consumers switch to plant-based diets or plant-based meat alternatives they are thinking about the environmental and health related factors among others.

The alternative food narrative comprises of multiple products that are local, fair, ethical or organic. This narrative is defined in contrast to conventional food systems, the conventional being married to intensive, industrial farming and an agri-food system driven by productivity and also a system that lauds quantity over quality (Morgan 2010). For example, soya products or legumes that plant-based meat alternatives are made of are possibly produced using large scale intensive farming methods (Robinson 2018). Conversely, alternative products contribute to ethical foodscapes that are intrinsically associated with ecological integrity and social justice, key indicators of a sustainable food system. However, the conventional industry threatens the alternative food narrative when it offers products that are more cost-effective. Further, plant-based meat alternatives and other processed foods are less likely to be local or have a comparatively lower carbon footprint, and scientists argue that Life Cycle Assessments are the only reliable method for carbon labelling (Morgan 2010). Plant based meat supports ecological integrity, animal rights and ethics (Goodland and Pimental 2000, Holker et al.

2019), however it raises questions regarding attitudes of consumer groups towards concepts of fair, organic and social justice. It also raises questions regarding how would consumers prioritize factors and trade-offs in connection with plant-based meat analogues and intensive agricultural practices and value of the product.

3.2 Foodscapes, tastescapes and meatscapes

In the past, concepts such as foodscapes, tastescapes and meatscapes have emerged in literature. Foodscapes are a lens of imaginary geography of food that analyses the food preferences of Swedes (Bildtgard 2009), tastescapes is the study of real and imaginary histories of Asian American diaspora (Pazo 2014) and meatscapes are " a conceptual and linguistic tool to unravel the entangled reality of meat in Delhi" (Ahmad 2014, 21). The concept or suffix of scape is used that enables us to navigate through asymmetrical paths and varying contexts (Ahmad 2014, Bent 2011). Foodscapes are dynamic and are continuously altering with different events (Dolphijn 2004), they are fluid, culinary emulsions in a community shaped by multiple factors such as region, tradition, history, social organizations, science and technology (King 2009). The author also states that in a community, foodscapes include production, purchase, preparation and the relationship between members and these processes. They comprise of multiple tangible sensory factors such as taste, smell and texture. The author categorizes foodscapes into different levels and suggests that its nature can be personal, social, public or encompassing all the individual, community and nation.

Bent (2011) also define foodscapes as an intangible public space where food is written or spoken about, for example in media. This conception is ideal for macro perspectives on a national or global scale pertaining to production, food brands, food culture and food marketing. This impression of foodscapes can be drawn from Appadurai's mediascape and is pertinent to the concept of food mediascapes (Bent 2011). Other significant concepts of food environment for consumers are availability of healthy options, prices, market promotion and nutritional information (Glanz et al. 2005).

3.3 Alternative Meatscapes

The alternative meatscape is derived from the Appadurai's (1990) formative work on scapes known as mediascapes, ethnoscapes, technoscapes, ideoscapes and financescapes. It is a unique concept created for this study that also borrows from meatscapes (Ahmad 2014),

foodscapes (Bildtgard 2009, Bent 2011) and food environment (Glanz et al. 2005). The alternative meatscape could be based on concepts such as plant-based diets or vegetarianism due to religious or cultural practices, however in this study the alternative meatscape examines plant-based meat alternatives. The alternative meatscape is defined as a combination of real and imagined worlds and interactions among various factors to influence attitudes consumers pertaining to plant-based meat alternatives.

Following most of Appadurai's scapes (1990) this study explores, one, how media has led to dietary changes for consumers. Two, how consumer groups react and perceive sensory experiences created by technological innovation replicate the meat experience and also ultra-processed nature of plant-based meat alternatives. Three, if consumer groups think of plant-based analogues as meat replacements or a separate product category. Four, how consumer groups weigh, for example, environmental factors and value or price of plant-based meat alternatives. Even though this study is specific to a residents of the UK, ethnoscapes was not as relevant as mediascapes, financescapes, ideoscapes or technoscapes.

Consumer groups do not perceive plant-based meat alternatives and food systems in isolation, rather social practices, relations and situations influence each other apart from mere representation (Fairclough 1992). There are multiple terms for these relationships and interactions and are known as shared discourses, cultures or definition (Bildtgard 2009). The alternative meatscape is immersed in a nebulous imaginary, physical, social and cultural context. Interactions between mental images, online, physical, social platforms and cultural contexts related to alternative meatscapes influence food choices for consumer groups in the UK.

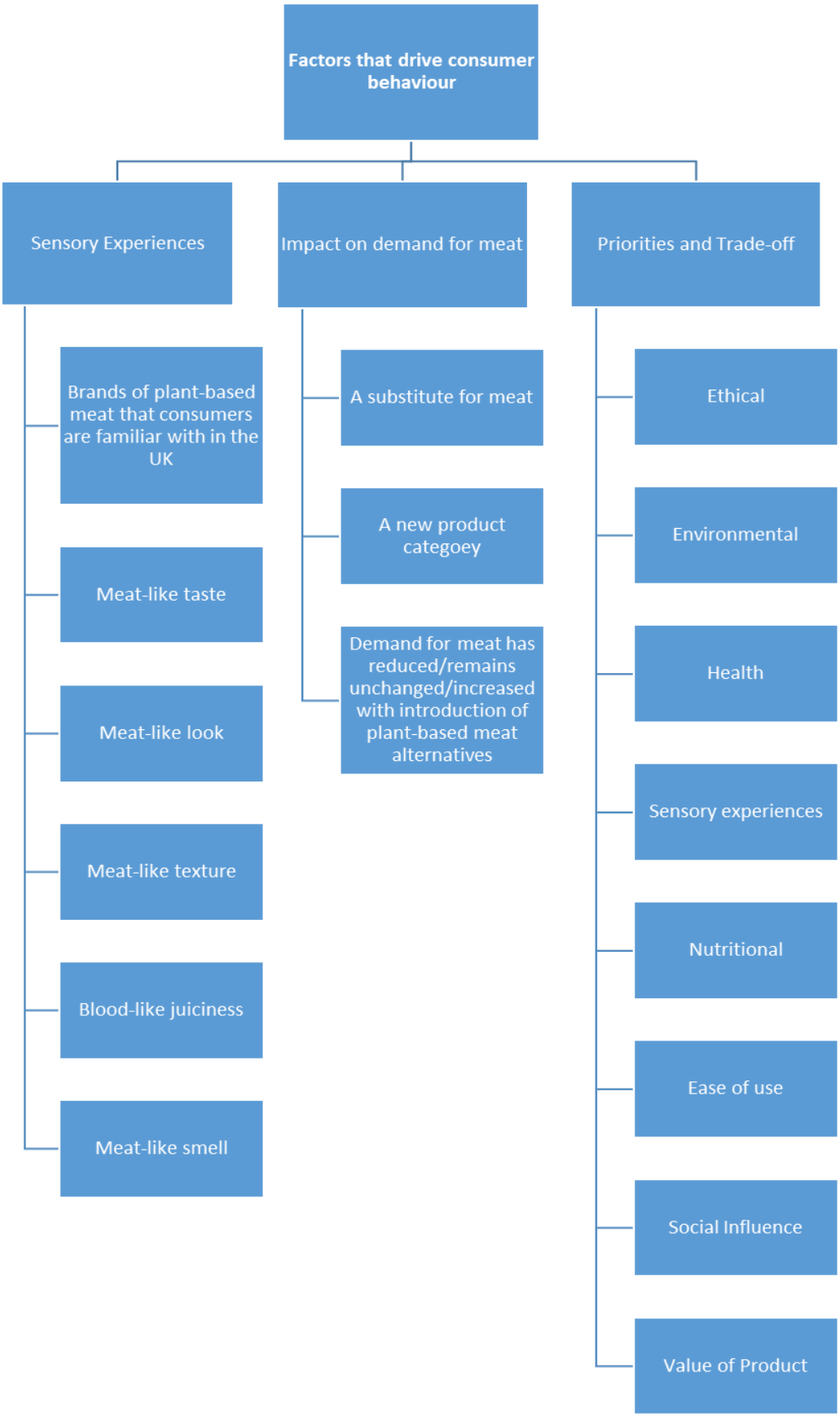

Figure 3.1 Factors that are explored under alternative meatscape framework

For this study, Figure 3.1 represents the three categories that are explored in this study within the Alternative Meatscape.

Sensory experiences: This chapter includes familiarity and preferences of plant-based meat alternative brands. These preferences could arise due to certain brands being well-known since they have been prevalent in UK since the last decade, while novel brands might be more discussed through advertisement, documentaries and as the brands claim they have a unique selling point of phenomenal similarity to meat. Apart from brands the sensory experiences offered by both pre-existing and newer brands pertaining to similarity to meat are explored. It highlights how different consumer groups have varying opinions regarding plant-based meat alternatives due to ideologies pertaining to sensory perceptions. The fifth chapter discusses how a plant-based meat alternative can be too meat-like for a vegan or vegetarian and not meaty enough for an omnivore or heavy meat eater. The variation in expectation can lead to feelings of disgust arising for ethical reasons for vegans/vegetarians and perhaps the dissatisfaction of meat like sensory experience for heavy meat eater or omnivores.

Impact on demand for meat: This chapter explores if different consumer groups consider plant-based meat alternatives as meat replacement or a new product. It discusses how different consumer groups use plant-based meat alternatives and based on their ethical views, nostalgia feel for those vegans and vegetarians who like meat but have given it for ethical or environmental factors, while others who have been vegan or vegetarian throughout their life – do they think of plant-based meat alternatives as not akin to meat but a separate food item. Perhaps, there could be conflicts or discrepancies within individual consumer group as well. Moreover, this chapter studies if plant-based meat alternatives companies have been successful in influencing consumer groups, specifically flexitarians, omnivores, heavy meat eaters and those with an ultra-processed diet to reduce their demand for meat by choosing plant-based analogues instead.

Priorities and Trade-offs: In this chapter, the behaviour of consumers due to factors that they consider priorities and others that lead them to make trade-offs with their priorities are explored. It studies how social influence from household members including family, flatmates, a partner or children can lead to changes in consumer behaviour. Price could perhaps counterbalance priorities of ethical and environmental considerations. Perhaps

neophobia or the ingrained taste of meat might prevent some consumers from trying plant-based meat alternatives. For some consumers, the ultra-processed nature of the product might lead to being a barrier, while other groups might consider it healthier than meat. It discusses which factors are important for each consumer group, although the behaviour of consumer groups do not always reflect their priorities due to trade-offs lead to offsets. Often factors can influence or counterinfluence each other, leading to dissonance between ideologies of consumer groups and behaviour of individuals.

4. Methodology

Plant-based protein has held a focal point in food sustainability discourse since 2015 (Ehgartner 2020). Ehgartner also states that due to a requirement of a more diverse protein-rich food range, there is an emergence of plant-based product innovation products that are sold alongside animal-based meat. This diversity supports consumer sovereignty and has created a new market for vegans, vegetarians, flexitarians or health- conscious consumers. In addition to vegans, vegetarians, flexitarians, this study includes omnivores, heavy meat eaters and those with ultra-processed diets. Identified as a gap from the literature review, attitudes of different consumer groups towards plant-based meat alternatives forms the primary focus of this study.

This chapter discusses the methodology used to conduct this study. It includes research design and methods used for data collection.

4.1 Research Design

This thesis has used a hybrid methodology including both qualitative and quantitative data analysis. A mixed method was adopted as the study aimed to examine the ecological perception, priorities and trade-offs and sensory experiences of consumer groups towards plant-based meat substitutes. It also examines whether consumer groups perceive plant-based meat analogues as meat substitutes or as a separate and new product category. These methods were adopted to understand attitudes of consumer groups, based primarily on dietary preferences or levels of meat consumption, towards plant-based meat alternatives in the UK. In order to address the research questions, this thesis collected qualitative and quantitative data, the survey and interview questions were designed to understand how different consumer groups prioritize factors pertaining to their diet. Some of the factors included, environmental impact, animal ethics, nutritional requirements, price of products as well as taste and other sensory experiences such as texture, smell, appearance of plant-based meat alternatives and social influences.

Using both interviews and a survey, the study examines consumer attitudes towards the ecological impact of plant-based meat alternatives in the UK. The study began with secondary research of existing literature comprising of trends and perceptions noted in the plant-based meat alternative industry as well of identification of gaps in research. Thereafter, a research design was created to incorporate attitudes of consumers with varying dietary preferences,

including collection of written data from surveys and verbal discussion from semi-structured online interviews. Participants from snowball sampling offered their consent for interviews by expressing their interest in the survey and were contacted subsequently. Considering the extraordinary circumstances created by the COVID-19 pandemic, the methodology incorporated surveys and interviews was conducted in an online format.

Consumer groups were created on the basis of dietary preferences that form the crux of this study. The 6 groups included in the study are named and defined below:

- Vegan: no animal product
- Vegetarian: no meat but includes dairy and eggs
- Flexitarian: plant heavy diet with occasional consumption of meat or fish
- Omnivore: eats both plants and meat
- Heavy meat eater: meat heavy diet: more than 700 grams or 7 servings of meat per week
- A consumer with an ultra-processed diet: mainly chips, chocolate, candy, ice-cream, sweetened breakfast cereal, chicken nuggets, hot dogs and more

4.2 Respondents

There were two study groups, one contacted through snowball sampling and the other through Prolific, an online survey service. Two groups were created as it was essential to reach out to consumers with varying dietary habits, age, education and gender. If only snowball sampling was used, respondents within the researcher's network were likely to be students of Environmental Science, leaning towards vegetarian or vegan habits and of a younger age group. For snowball sampling, the author circulated the survey within CEU's network, vegan and vegetarian groups on Facebook and Food, Climate and Research Network (now Table). Whereas, the second group through Prolific enabled outreach to a larger and more varied sample with regard to dietary habits, age and education.

The snowball sampling received 42 responses, from which 39 responses were valid and from Prolific I received 193 responses. From the snowball sampling methods, I was able to conduct online interviews for 12 volunteers from the snowball sample, these volunteers had mentioned their interests in interviews through their survey responses. The names and personal

information of the participants has been kept anonymous and they have been assigned numerical values between R1 – R12 as seen in the table below. It is also important to note that data for this thesis is not representative, but to illustrate attitudes of different consumer groups towards plant-based meat alternatives.

4.2.1 Respondent Profiles of qualitative interviews from snowball sample

Respondent	**Dietary Preference**	**Gender**	**Age group**	**Education**	**Vegan or veg society**	**How did they hear of the survey?**
R1	Vegan	Female	18 - 24	Master's degree	No	Food Climate Research Network
R2	Vegan	Female	25 - 34	Master's degree	No	Contacted through a friend
R3	Omnivore	Male	25-34	Master's degree	No	Direct contact
R4	Vegan	Male	25 - 34	Bachelor's degree	Works with a vegan organization	Through vegan organization
R5	Vegetarian	Female	18-24	Bachelor's degree	Leads vegetarian group at university	Through vegetarian society
R6	Vegan	Female	18-24	Pursuing a Bachelor's degree	Leads a vegan group at university	Direct contact through Facebook
R7	Vegan	Female	35 - 44	Bachelor's degree	Works with a vegan charity	Through vegan charity
R8	Omnivore	Female	25 - 34	Master's degree	No	Direct contact
R9	Vegetarian	Female	18 - 24	Bachelor's degree	Previously a vegetarian group at university	Direct contact
R10	Vegetarian	Female	45 - 54	Master's degree	No	Through Fodder, a newsletter
R11	Flexitarian	Male	35 - 44	PhD.	No	Food Climate Research Network
R12	Flexitarian	Female	25 - 34	Master's degree	No	Direct contact

4.2.2 Profile of consumer groups from both Prolific sample and Snowball sample combined

This section introduces the profiles of respondents from the surveys on the basis of gender, age and education.

4.2.2.1 Gender

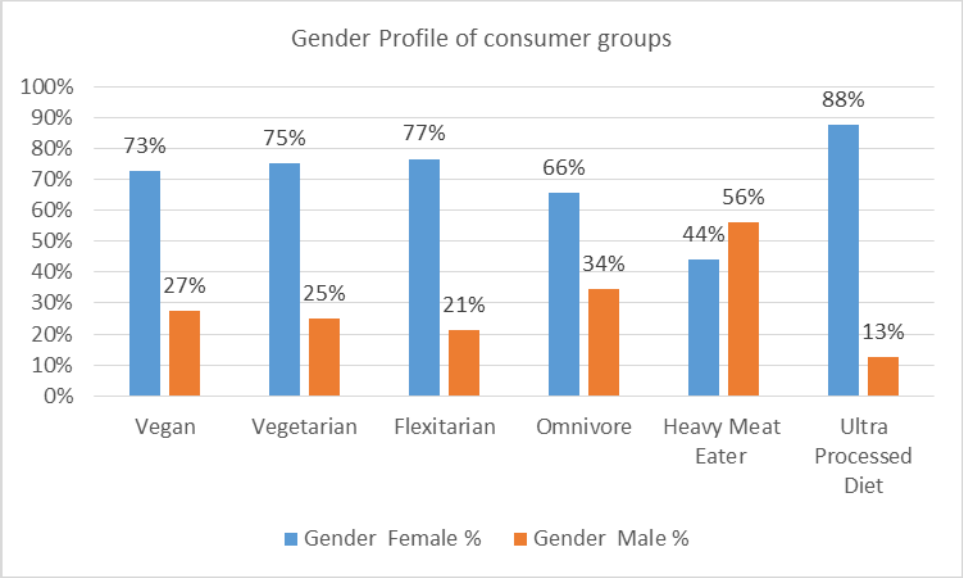

Figure 4.2 Gender profile of different consumer groups (Combined)

From Figure 4.1, it is noted that the consumer groups are divided by gender, respondents could choose from female, male and other. However, the representation from the other category was not sizeable and hence has been excluded. The bar graph depicts that the female respondents are more than majority male respondents for Vegan, Vegetarian, Flexitarian, Omnivore and Ultra-processed diet group. While, the male respondents are slightly more than majority for the Heavy Meat Eater category. Unsurprisingly, the above graph confirms the claims of Apostolidis and McLeay (2016), who found that green consumers in the UK were mainly female, similar results have been found previously.

4.4.4.2 Age

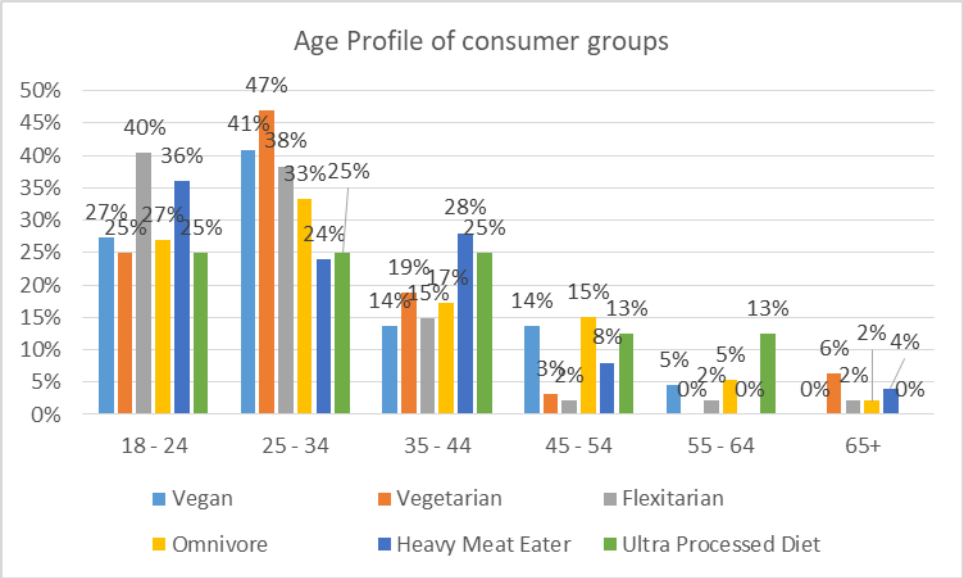

Figure 4.3 Age profile of different consumer groups (combined)

In the age section of consumer profiles, Figure 4.2 represents six categories of age ranging from 18-24, 25-34, 35-44, 45-54 and 55-64 to 65+. It is inferred that the highest number of respondents are in the younger age group ranging from 18-34 and 55-64 and 65+ have the least number of respondents.

Vegan group: 25-34 had the highest percentage of vegans, followed by 18-24. While 35-44 and 45-54 had the same percentage of 14% of vegans and 55-64 had only 5% of vegans. While none in the 65+ age group identified as vegans.

Vegetarian group: the highest percentage was observed in 25-34 group, followed by 18-24, at 19% for 35-44 and 6% for 65+ and 3% for 45-54 group. While none of the 55-64 age group respondents identified as vegetarians.

Flexitarian group: highest percentage for 18-24 age group at 40%, followed closely by 25-34 at 38%, 15% for 35-44 group and 2% each for 45-54, 55-65 and 65+.

Omnivore group: highest percentage of omnivores were in the 25-34 group, followed by 27% for 18-24 group, 17% for 35-44 group, 15% for 45-55 group, 5% for 55 – 64 group and 2% for 65+.

Heavy meat eater: highest percentage were in 18-24 group, followed by 35-44 and 24-34 group, 8% for 44-54 group, 4% for 65+. There were no respondents for 55-64 age group.

Ultra-processed diet: It was 25% of 18-24, 25-34 and 35-44 age group, while it was 13% for 45-54 and 55-64. 0% for 64+ age group.

Also noted previously, green consumers in the UK were not only predominantly female but also fell in the 18-34 age category (Apostolidis and McLeay 2016).

4.4.4.3 Education

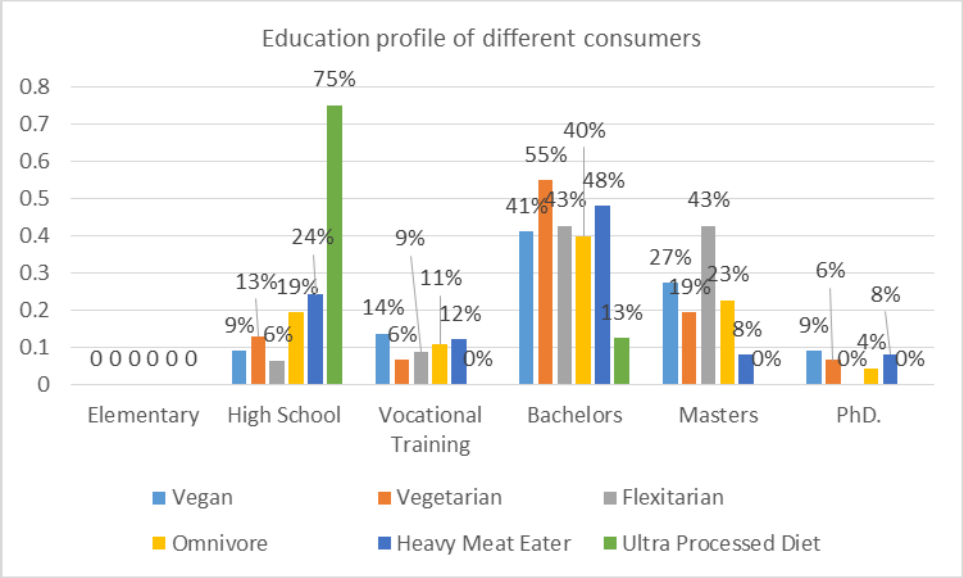

Figure 4.4 Education profile of different consumer groups (Combined)

In the education section of consumer profiles, Figure 4.3, illustrates six categories of education including elementary, high school, bachelors, masters, PhD and other. The elementary education group had no respondents.

Vegan group: The highest percentage of respondents had a bachelor's ', followed by master's' and at the same level of 14% for vocational training and 9% those with a PhD. and high school education.

Vegetarian group: The bachelor's group had more than majority at 55%, followed by master's group, with high school having a percentage of 13% and vocational training and PhD. groups having 6% of vegetarians each.

Flexitarian: The bachelor's and master's group had the same level of flexitarians at 43%, 9% for vocational training and 6% for high school group. While there were responses PhD. group.

Omnivore: The bachelor's group had the highest percentage at 40%, followed by master's group at 23%, while 19% for high school group, 11% for the vocational training group and 4% for those with a PhD.

Heavy Meat Eater: The bachelors group was also the highest meat eater group, followed by high school education, vocational training and at master's and PhD. at the same level of 8%.

Ultra-processed diet: Only 2 categories, high school has 75% of consumers with an ultra-processed diet, while the bachelor's group had 13%. The other groups did not identify with an ultra-processed diet.

In conclusion, a large majority of the participants are females. The highest percentage of respondents fall within the 18-34 age group. While the highest percentage of participants have a bachelor's degree followed by respondents with a Master's degree.

4.3 Methods for Data Collection

The process of data collection from surveys to interviews took about one month. This section explains the different methods that were employed for data collection.

4.3.1 Online Survey

A questionnaire was created using Google forms and this form was circulated among the researcher's social network and also through Prolific. The survey had 35 questions and participants required approximately fifteen minutes to complete it. The survey also had an option for participants to volunteer for a 30 minute in-depth conversation.

4.3.2 Online Interviews

From the survey, 23 respondents agreed to participate in the interview or in-depth conversation as per research ethics guidelines, however, one of them did not qualify as he had never lived in the UK. Interview schedules were set up using Doodle and ultimately 12 participants responded positively. These interviews were conducted and recorded using the Zoom app. Further, these interviews were transcribed using Otter, an app, for qualitative data analysis.

4.3.3 Methods for Data Analysis

To analyse the qualitative data collected from the interviews, the framework of critical sociological discourse was borrowed. Fairclough (1992) refers to language as social practice, rather than an individual activity or based on situations. He defines discourse as "a mode of action, one form in which people may act upon the world and especially upon each other, as well as mode of representation" (Fairclough 1992, 63). In other words, discourse includes social practices, social relations and situations and not only represent them but also build them. Moreover, data

analysis is more than interpretation of texts and includes historical and social context (Fairclough 1992, Ehgartner 2020). To understand how consumers perceive plant-based meat alternatives, it is necessary to understand the meaning of respondents that is brought out through language, which can be interpreted through discourse analysis. From the theoretical framework the discourses were identified from the three main themes of sensory experiences, perception of plant-based meat alternatives in relation to meat and priorities and trade-offs were developed for the analysis of this study and to address the research questions.

For data analysis, two different paths were followed for qualitative and quantitative data. For quantitative data, the survey responses from both groups was downloaded in Microsoft excel format, the data was then cleaned to assign numerical values for different categories. The cleaned data was then sorted and filtered on the basis of dietary preferences, gender, age and education to create a general profile of the respondents in the UK. Moreover, data was further filtered separately and then combined on the basis of similar trends and represented in the form of graphs to address the research questions.

For qualitative data analysis, the content from online interviews via Zoom were analysed after transcriptions of the interviews. The results were coded to align with the main themes of the theoretical framework such as from these interviews, certain themes were identified and the qualitative data was organized accordingly. The transcriptions were arranged categorically in the form of dietary choices, food procurement, cooking at home, and new product vs. plant-based meat substitute, social influence and personal ideas about food systems. Further, responses based on consumers from the same dietary group were collated to respond to the research questions.

4.4 Limitations

This study employed participants who are or have lived in the UK from snowball sampling as well as Prolific, the survey service. However, due to the COVID-19 pandemic, the researcher was unable to visit physical locations to conduct focused group discussions and in-person interviews with student groups as well customers at cafes, restaurants and supermarkets that sold plant-based meat alternatives. Some respondents in affiliation with INGOs did not respond after the initial connect.

Although, the Prolific service has been tried, tested and recommended by other researchers in the UK, its services are chargeable and it was an expensive means to obtain responses. Moreover, I was unable to follow up on interviews from respondents from Prolific, as the interview rates were beyond the budget of the university grant that had been obtained. This could be a shortcoming and results would have been more holistic if I had been able to interview respondents from Prolific as well. It is essential to note that this study is not representative of perceptions of consumer groups towards plant-based meat alternatives in the UK.

While conducting quantitative data analysis, I realized that I had missed out on asking respondents for information regarding their income. Plant-based meat alternatives are more expensive in comparison to meat and it would have been useful to analyse trends based on consumer incomes. Another data point that could be altered was the location of respondents, while conducting interviews, participants would naturally begin talking about their current situation in a location that was not in the UK or different circumstances created by COVID-19. Perhaps, it would have been more suitable to have selected participants who were living in the UK for the purpose of this thesis. Also to assess urban and rural differences, if any regarding availability of plant-based meat alternatives.

Even though I have not been to the UK earlier, I am adept at the language however a few cultural differences arose during interviews and the researcher might have been able to go in-depth if they had been conducted in person. For example: the main meals of participants, whether they followed a system of breakfast, lunch or dinner or breakfast, dinner and tea. Moreover, out of these, in which meals they would typically consume plant-based meat alternatives.

The next chapters (five, six and seven) reports the results of the study and the discussion that links it to the research aims and analyses the results according to the theoretical framework.

5. Sensory experiences and expectations

"*The full sensory experience of eating a slab of meat starts when the constituent proteins, fats and sugars within it interact during cooking. Apply heat and the amino acids and sugars react. The meat goes brown and releases dozens of volatile molecules that give it its flavour and odour in a process known as the Maillard reaction. Afterwards, as the meat is eaten, the bite, texture, umami flavour and melting fats combine to give meat-eaters an experience that they know as meaty" (Jaso 2019). Hoek et al. (2011) states that plant-based meat substitutes should be made to resemble meat and have better sensory attraction rather than communication of ethical arguments. This leads to a conundrum of not only making meat-less alternatives resemble meat but highlights their similarity to meat rather than ethical arguments. This chapter analyses the sensory perceptions of different consumer groups, not only meat-eaters regarding plant-based meat alternatives and compares their experiences with the product's affinity to meat.*

5.1 Overview of the Chapter

In this chapter, the first RQ (How do different consumer groups perceive sensory experiences and expectations of eating plant-based meat alternatives?) is addressed. To illustrate the different sensory experiences that consumer groups have felt, the chapter is organized thematically by different consumer groups and their sensory experiences of the affinity of plant-based meat alternatives to meat. It analyses qualitative excerpts from snowball sample and combination of quantitative data from snowball sample as well as Prolific sample.

5.2 Consumer's sensory experiences when eating plant based meat alternatives

This section discusses the different sensory experiences that consumers have had with plant-based meat alternatives. First, it offers a snapshot into brands that consumers in the UK have tried. Respondents were asked to provide a rating to each category created based on similarity of plant-based meat alternatives to meat. It also presents their sensory experiences with plant-based meat alternatives from qualitative excerpts.

5.2.1 Brands of plant-based meat that participants are familiar with in the UK

This section contextualizes the sensory experiences of respondents towards plant-based meat alternatives based on its resemblance to meat. It begins with a graphical representation of brands of plant-based meat alternatives that different consumer groups have tried. It also analyses excerpts from qualitative interviews.

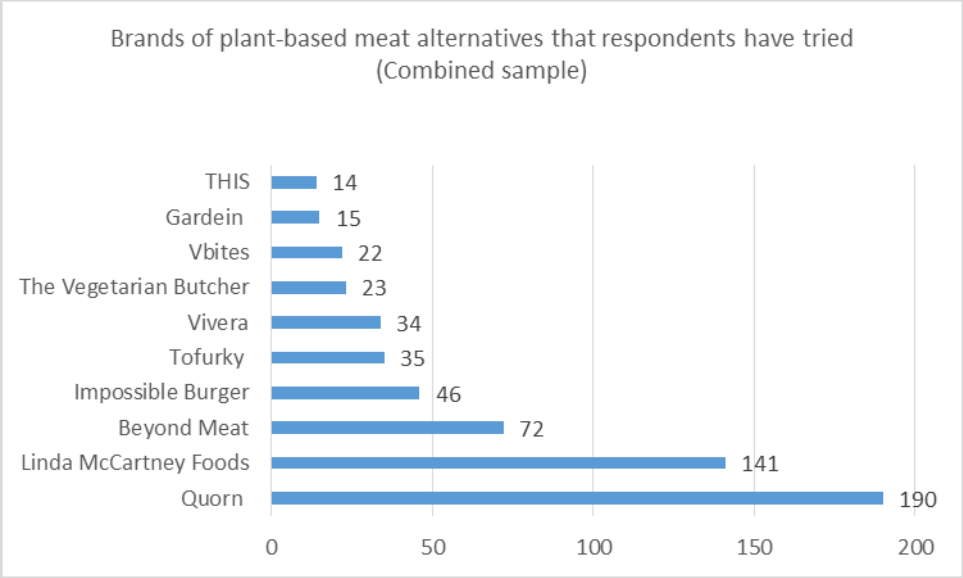

Figure 5.1 Brands of PBMA that consumers have tried

In the above Figure 5.1 (The data labels are not in percentage as consumers could choose multiple options), it is seen that the highest number of consumers are familiar with Quorn, which was expected, considering Quorn has been in the UK since 1980s (Hoek et al. 2011). Quorn is an ultra-processed food that uses mycoprotein, a kind of fungus as its fundamental ingredient. Its vegetarian range also includes eggs as an ingredient but the vegan range substitutes it for potato proteins in addition to multiple hi-tech ingredients and additives. Linda McCartney Foods is in second place, also been prevalent in the UK since 1991(Allen 2006). Followed by the novel and ultra-processed Beyond Meat, uses beet juice to imitate a blood-like red colour and Impossible Burger, uses heme iron molecule from soy or leghemoglobin for its blood-like juiciness and meat-like taste. Both have been introduced in the UK only recently, in the last few years (Blythman 2018). The top four brands of Quorn, Linda McCartney Foods, Beyond Meat and Impossible burger also emerged as popular brands from the literature review.

Tofurky is in fifth place, followed by Vivera, The Vegetarian Butcher, Vbites, and THIS. Both the snowball sample and Prolific sample followed a similar trajectory and hence a combined graph has been presented.

Apart from the brands mentioned in the graph, participants were asked to specify any other brands that they might have tried, they mentioned Cauldron, Bird's Eye, Fry's, Plant Pioneers (Sainsbury's in house brand), Gro, Meatless Farms, Taifun, Tesco's in house brand, Richmond, Plant Kitchen, Moving mountains, Oumph!, Tivall[4], the Co-ops plant-based section and Aldi's own brands (Survey answers).

5.2.2 Sensory experiences for different consumer groups

This chapter provides graphical representation from both Prolific and snowball sample surveys regarding sensory experiences of different consumer groups. It also includes excerpts from the interviews from snowball sample.

[4] Even though Tivall has been in the UK since 1981, it is not as popular as Quorn (Interview notes).

Figure 5.2 below presents the different categories that respondents were asked to rank the plant-based meat alternatives, such as meat-like taste, meat-like look, meat-like texture, blood like juiciness and meat-like smell.

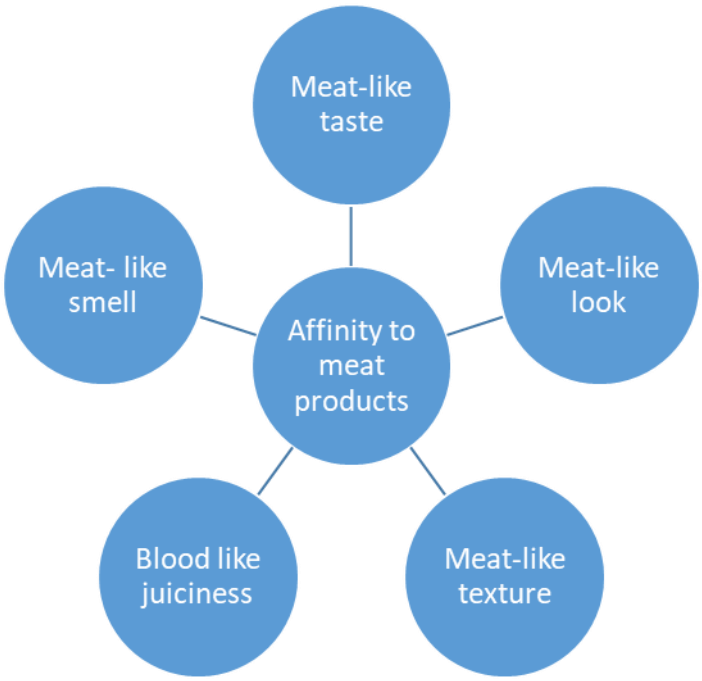

Figure 5.2 Choices for consumers to rate their sensory experience of PBMA[5] based on their affinity to meat products

5.2.2.3 Sensory experiences of different consumer groups as per online survey

The survey included a question regarding reasons why consumers purchased plant-based meat alternatives and a broad question about the importance of particular factors for consumers. The former question had five options on sensory rankings based on similarity between meat products and plant-based meat alternatives.

Below are a series of pie charts that represent why different consumer groups chose plant-based meat alternatives. In this chapter, the sensory experiences based on the affinity to meat of plant-based meat alternatives are discussed while other factors are referred to in next chapters. These charts are created with combined data from snowball sample and Prolific sample, there were differences between the two samples, however the snowball sample was too small and each group was not well represented. Moreover, there were no respondents for Heavy Meat Eater from snowball sample. While for Ultra-Processed Diet, there was no representation for snowball sample and it was underrepresented for Prolific sample.

[5] PBMA or Plant-based meat alternatives

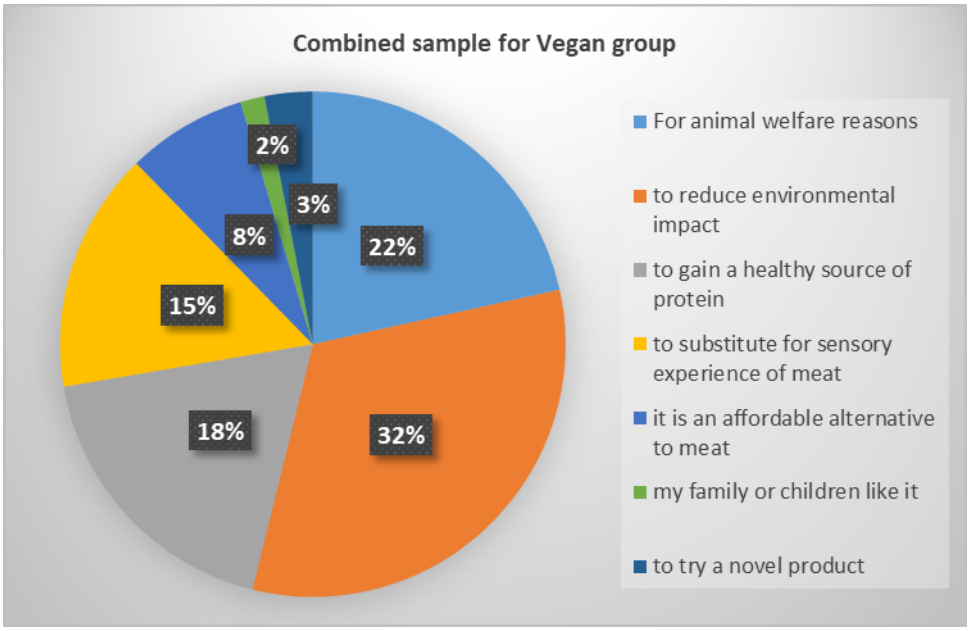

Figure 5.3 Vegan: Why did consumers choose plant-based meat alternatives?

From the above Figure 5.3, it is seen that reduction of environmental impact has the highest representation in the vegan group, followed by animal welfare reasons, healthy source of protein and then as a substitute for sensory experience of meat. While, affordable alternative, as a novel product and preference of children/family are at the bottom.

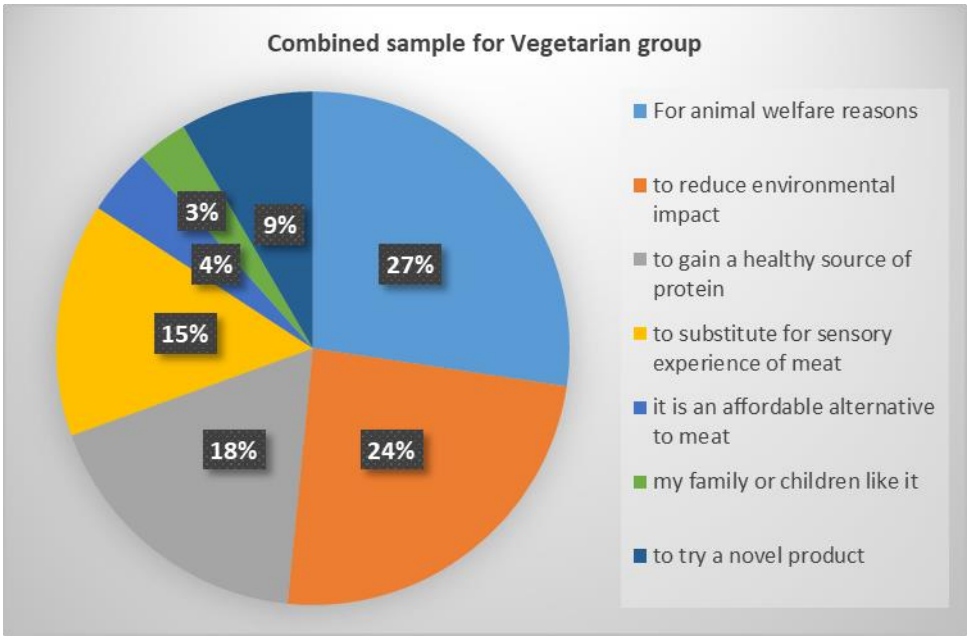

Figure 5.4 Vegetarian: Why did consumers choose plant-based meat alternatives?

From Figure 5.4, the highest representation for the vegetarian group for choosing plant-based meat alternatives is animal welfare, followed by reduction in environmental impact, healthy

protein source, and to substitute for sensory experience of meat. While, to try as a novel product, affordable alternative and preference of children/family are at the bottom.

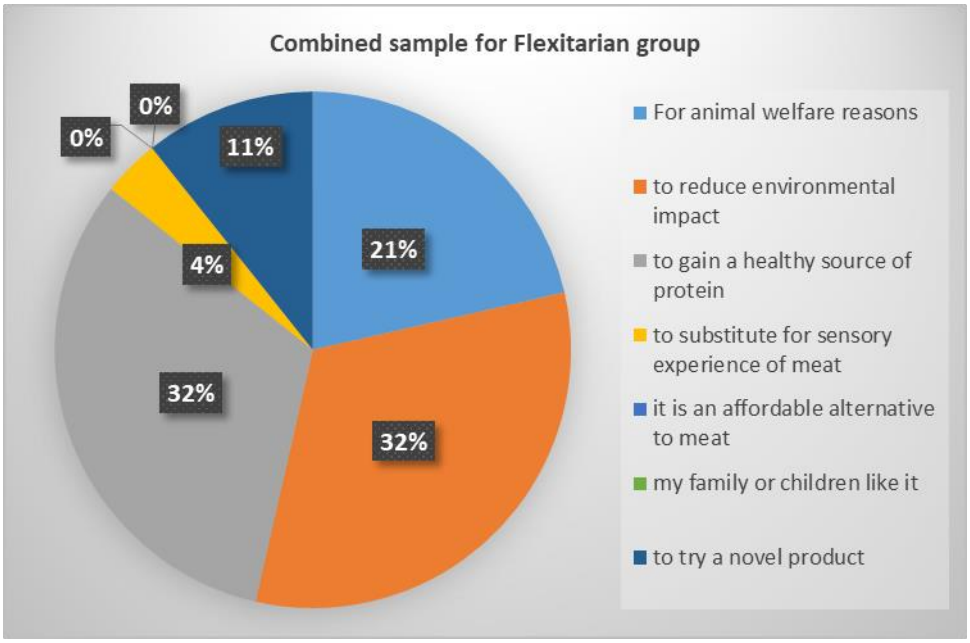

Figure 5.5 Flexitarian: Why did consumers choose plant-based meat alternatives?

From Figure 5.5, it is seen that the highest representation for flexitarian group is reduction in environmental impact and healthy protein source as top reason with the same percentage. Followed by animal welfare, to try a novel product and substitute for sensory experience of meat at fifth place. With no representation for affordable alternative to meat and preference of family/children.

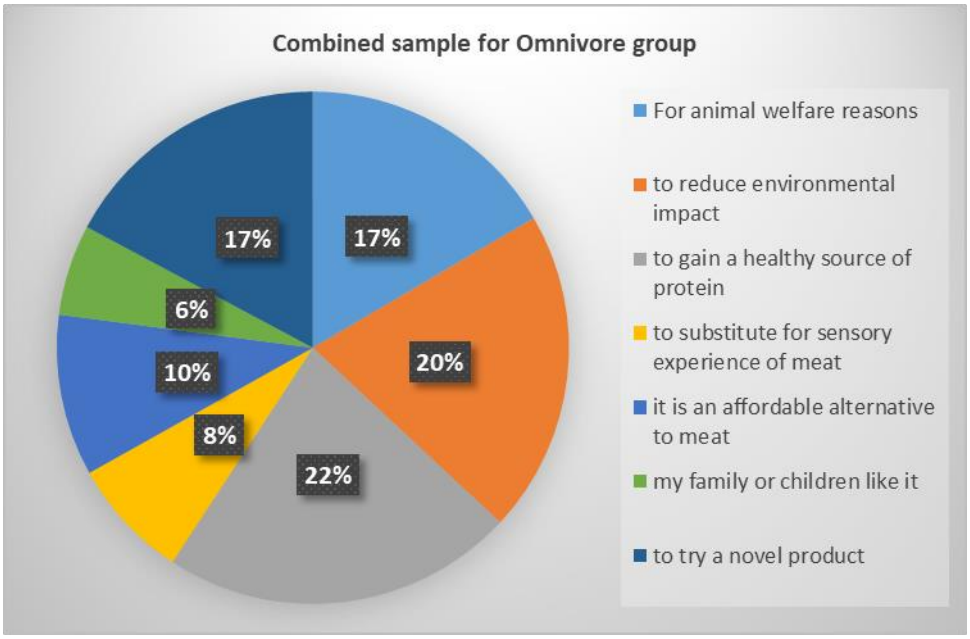

Figure 5.6 Omnivore: Why did consumers choose plant-based meat alternatives?

From Figure 5.6, the omnivore group has the highest representation for choosing plant-based meat alternatives as a healthy source of protein, followed by reduction in environmental impact, both animal welfare and to try a novel product both in third place. Further followed by affordable alternative to meat, a substitute for sensory experience of meat and preference of family/children.

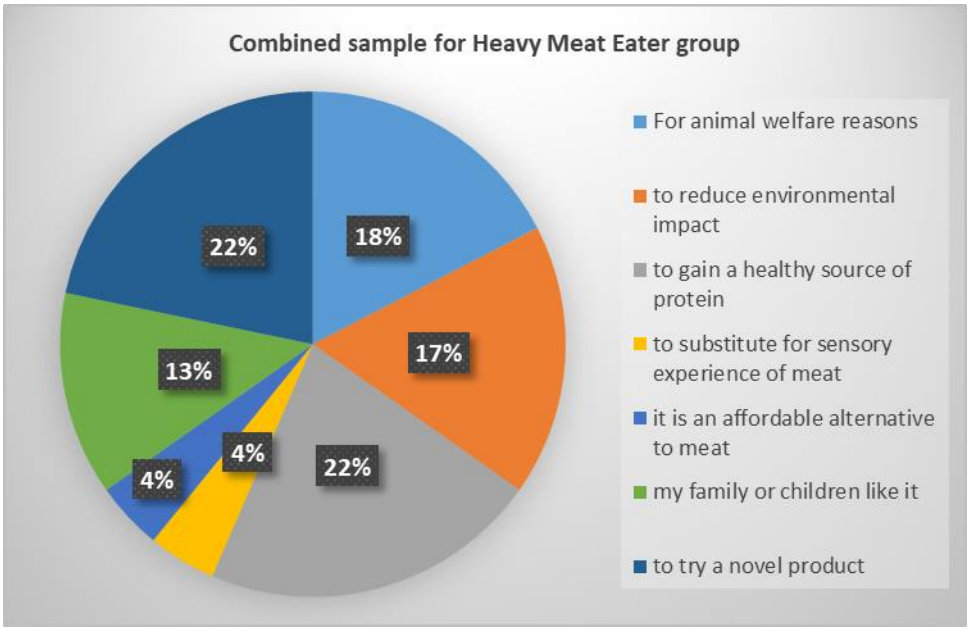

Figure 5.7 Heavy Meat Eater: Why did consumers choose plant-based meat alternatives?

From Figure 5.7, it is seen that the heavy meat eaters chose plant-based meat alternatives with healthy protein source and novel product both at 22%. Followed by animal welfare, reduction

in environmental impact, preference of family/children. Ultimately with affordable alternative and substitute for sensory experience of meat at 4%.

From the above Figures 5.3, 5.4, 5.5, 5.6, 5.7 it is evident that different consumer groups have varying reasons for choosing plant-based meat alternatives. The yellow wedge represents reason as substitute for sensory experience of meat. From the vegetarian and vegan group, 15% of the respondents chose plant-based meat alternatives for as a substitute for the sensory experience of meat. The flexitarian and heavy meat eater group was represented by 4% and omnivore group by 8% who chose plant based meat alternatives as a substitute for the sensory experience of meat. The above results demonstrate that the vegan and vegetarian groups choose plant-based meat alternatives for ethical and environmental reasons, while the omnivore and heavy meat eater group choose them for health reasons. Drawing back to literature review, similar to Hoek's (2011) argument, plant-based meat alternatives are attractive to those consumers that have ethical and environmental concerns. Since not all consumer groups consider ethical and environmental concerns as a priority, plant-based meat alternative companies are possibly using the sustainability by stealth strategy by highlighting their health benefits (Apostolidis and McLeay 2016), although not very successfully with the omnivore and heavy meat eater group. It is seen in the next chapter that plant-based meat alternatives has failed to reduce the meat consumption of the heavy meat category of consumers.

From the above results, it is evident that plant-based meat alternative companies have not been able to satisfy the sensory experience of meat for any of groups of vegan, vegetarian, flexitarian, omnivore or heavy meat eater. The vegans and vegetarians were perhaps meat eaters in the past who were looking for something meaty.

5.3 Data Analysis

Similar to the arrangement in previous sections, this section arranges the graphs based on the themes of different consumer groups created on their dietary preferences. Since the data from snowball sample and Prolific vary, this section includes graphical representations from both samples. As mentioned in an earlier section, the five factors that examine the sensory

experiences of consumers based on their affinity of plant-based meat alternatives to meat are meat-like taste, meat-like look, meat-like texture, blood-like juiciness and meat-like smell. The original data had a ratings from 0 – 5 for each of the five categories, 0 being least important and 5 being most important.

5.3.1 Vegan

Meat – like taste

Snowball sample

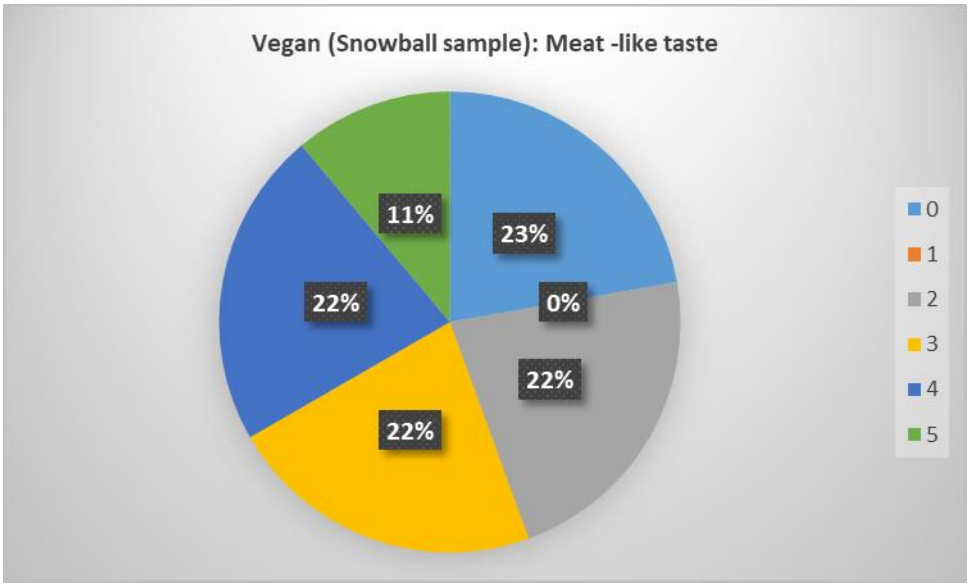

Figure 5.8 Vegan group (Snowball Sample): Meat-like taste of plant-based meat alternatives

From Figure 5.8, it is evident that vegans from the snowball sample that the highest percentage of respondents, 23% gave least importance for meat-like taste of plant-based meat alternatives. While there were no respondents who selected 1. While 22% each selected the next three numbers of 2, 3 and 4. While the lowest percentage 11% gave highest importance to meat-like taste of plant based meat alternatives.

While from the interviews the following was noted. The sensory experiences with respect to taste of plant-based meat alternatives varies. R1, a vegan finds it scary when plant-based meat analogues taste like meat and she doesn't like those particular products. It makes her question whether the product is actually meat or not and this aspect makes her uncomfortable. While R4, another vegan says that it depended on the product, for instance, "Quorn's chicken pieces do not taste like chicken, and its taste is slightly better than its texture" (Interview notes). He claims that he hasn't eaten chicken in a long time, however he does not associate the product's taste with

chicken. While another vegan, R2 is fond of the meaty texture and thinks that it makes food more interesting and likes it to be flavourful rather than bland. Although she claims that the plant-based meat analogues absorb flavours from the dish that she is cooking. While R7, another vegan, thinks that it's familiar in the way it looks, and in its taste. And a lot of meat eaters have said for example, "the Moving Mountain burger is tastier than a meat burger and it's still got that familiarity" (Interview notes).

Prolific Sample

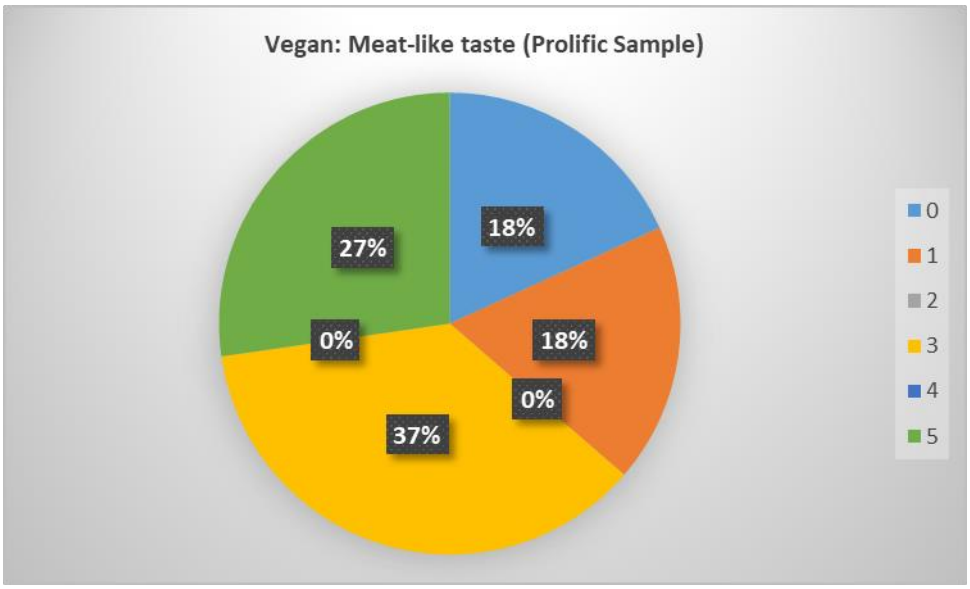

Figure 5.9 Vegan group (Prolific Sample): Meat-like taste of plant-based meat alternatives

In Figure 5.9, 18 % of respondents rated meat-like taste at 0 and 1 levels of importance. While 37% of the vegans rated meat-like taste at level 3 and 27% at level 5 or highest importance. While there were no respondents who rated eat-like taste at level 2 and 4.

As seen from the above figures, the ratings as per the vegan group regarding meat-like taste is not uniform over Prolific and snowball sample. It is not surprising, as some respondents have not been vegan since birth and are searching for products that resemble meat in flavour. Whereas, there are other vegans who even after having turned vegan at a later age, detest the taste of meat in their food, for some R1 it becomes uncomfortable, while a flexitarian respondents partner, who is vegan did not like her burger and she was unable to finish it (Interview notes).

Meat – like look

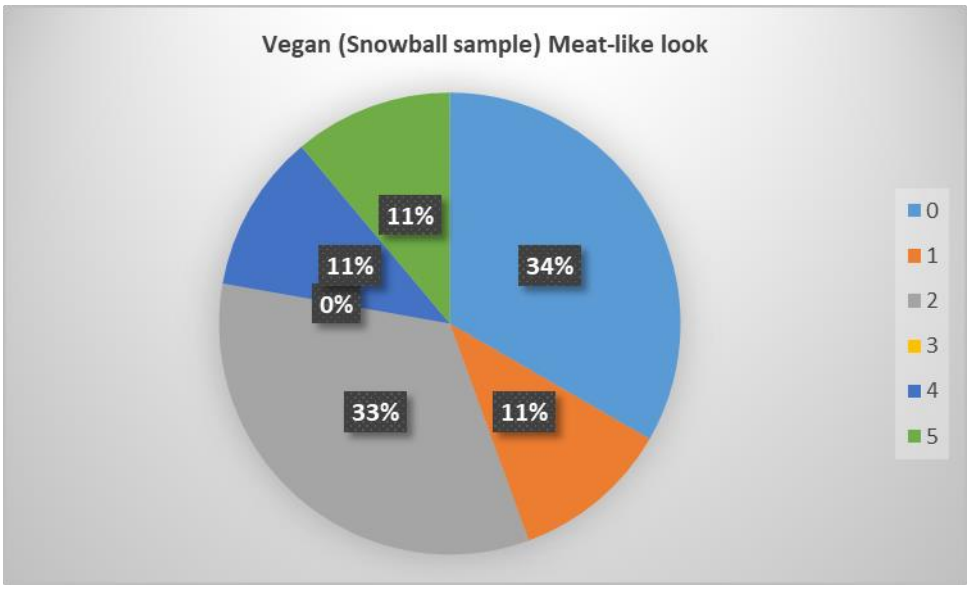

Figure 5.10 Vegan (Snowball sample): Meat-like look

Snowball Sample

From Figure 5.10, 34% choose the lowest rating at 0 for meat-like look, while a comparatively smaller percentage at 11% choose 1. While 33% choose 2 and 11% choose 4 and 5 respectively. With no respondents for level 3.

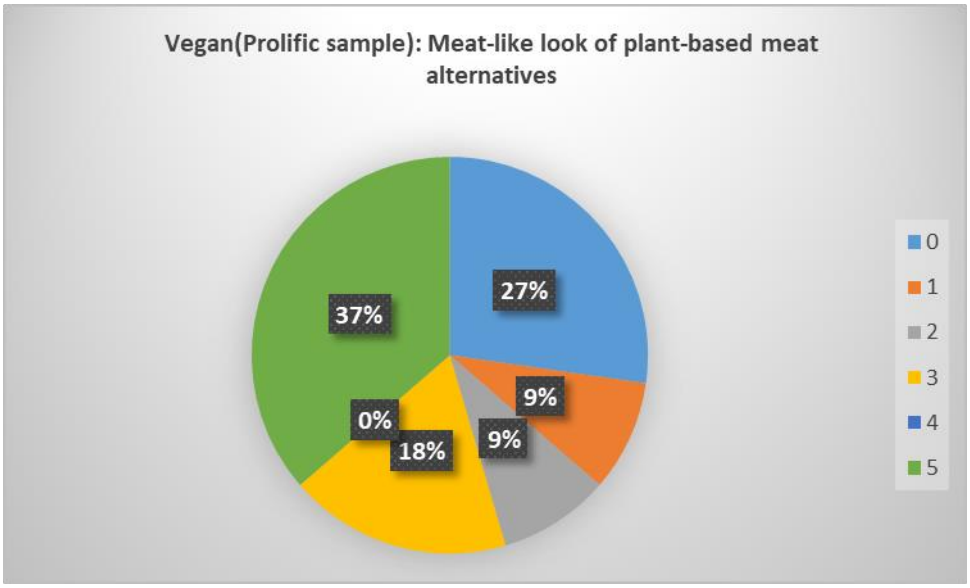

Figure 5.11 Vegan (Prolific sample): Meat-like look for plant-based meat alternatives

Prolific

From Figure 5.11, it is evident that 27% of the respondents chose level 0, while 9% chose 1 and 2 respectively, while 18% chose level 3and 37% chose level 5. With no responses for level 4.

From both snowball sample and Prolific, there are varying levels of importance to meat-like look that respondents assign to plant-based meat alternatives. Further, the Prolific survey has more respondents who gave a most importance or level 5 for meat-like look of plant-based meat alternatives. It is possible, that vegans were more comfortable admitting this in a survey rather than a personal interview.

Meat-like texture

Snowball sample

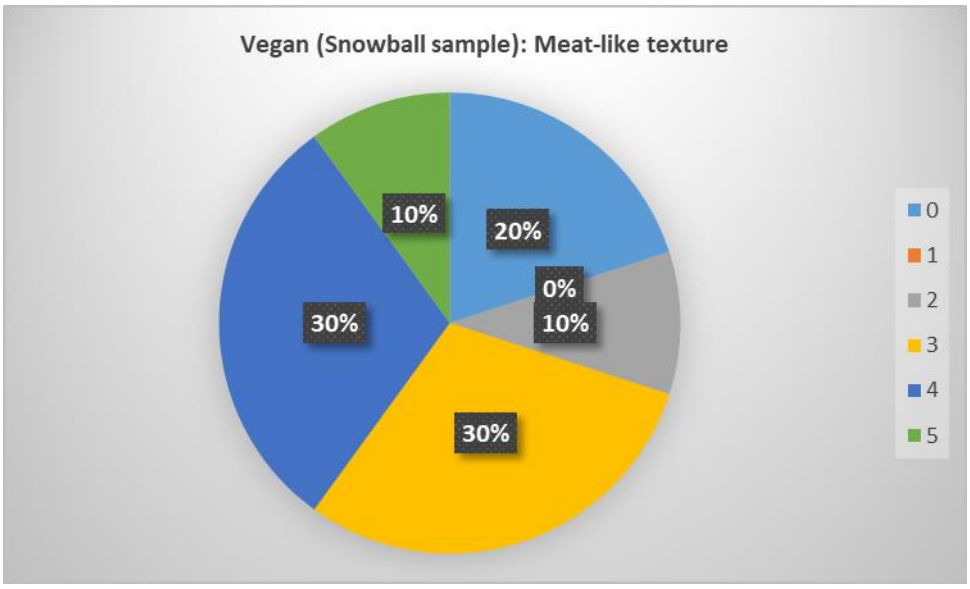

Figure 5.12 Vegan (Snowball sample): Meat-like texture for plant-based meat alternatives

From Figure 5.12, it is seen that 20% of vegans selected level 0 for meat-like texture, 10% chose level 2, 30% chose level 3 and level 4 respectively and 10% chose level 5.

From the interviews, For R1, a vegan, she is not very fond of burger patties made from meat analogues and does not like the whole patty or chunk of meat alternative. Although, she finds the texture extremely appealing and it's her top priority and she is also fond of the chewiness. She said, "I like for the product to have some sort of structural integrity because a lot of the sausages that I've tried are squishy and very off-putting" (Interview notes). She likes it if shreds, similar to chicken, both she and another vegan respondent, R2 don't like meat analogues that become moist or slimy. Similarly, R6 is very easily impressed and finds the plant-based alternatives to be very similar to meat with a good texture and right amount of chewiness. While R4, a vegan, thought these products were comforting and satisfying and he liked the Beyond Burger and that its texture felt like meat. However, for R6, the texture is not a priority for her and believes that it would make more meat eaters interested in it. She thinks that plant-based meat alternatives should be made meatier but not particularly because she likes it. R7, another vegan concurs and said that the familiar texture can be useful and less daunting or intimidating for people who eat meat.

Prolific

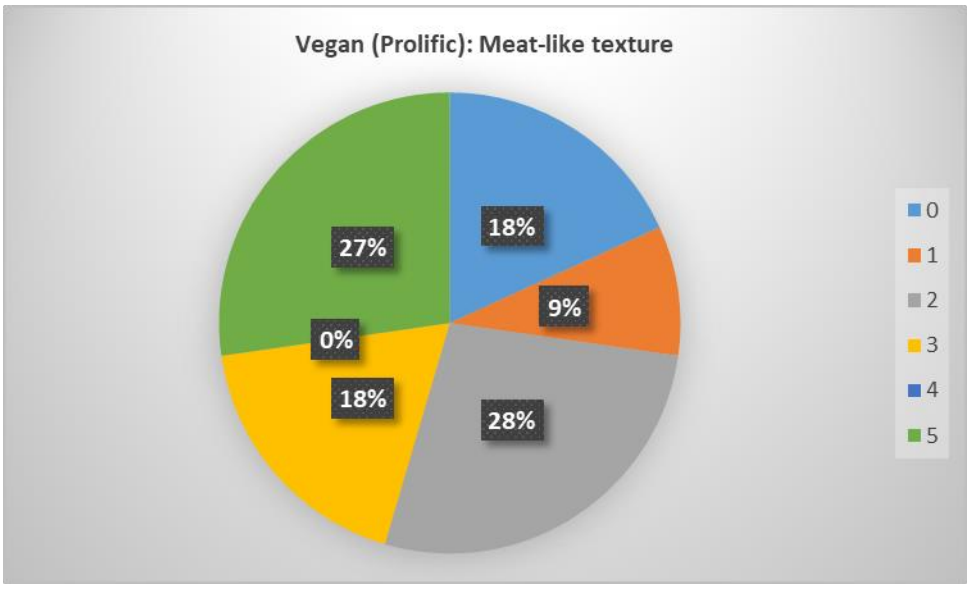

Figure 5.13 Vegan (Prolific): Meat-like texture for plant-based meat alternatives

From Figure 5.13, it is seen that 18% selected level 0 for the meat-like texture of plant-based meat alternatives. With 9% rating meat-like texture at level 1, 28% at level 2, 18% at level 3 and 27% at level 5. With no responses for level 4.

In this case, the vegans from the interviews and snowball sample survey gave higher importance to texture of plant-based meat alternatives.

Blood-like juiciness

Snowball sample

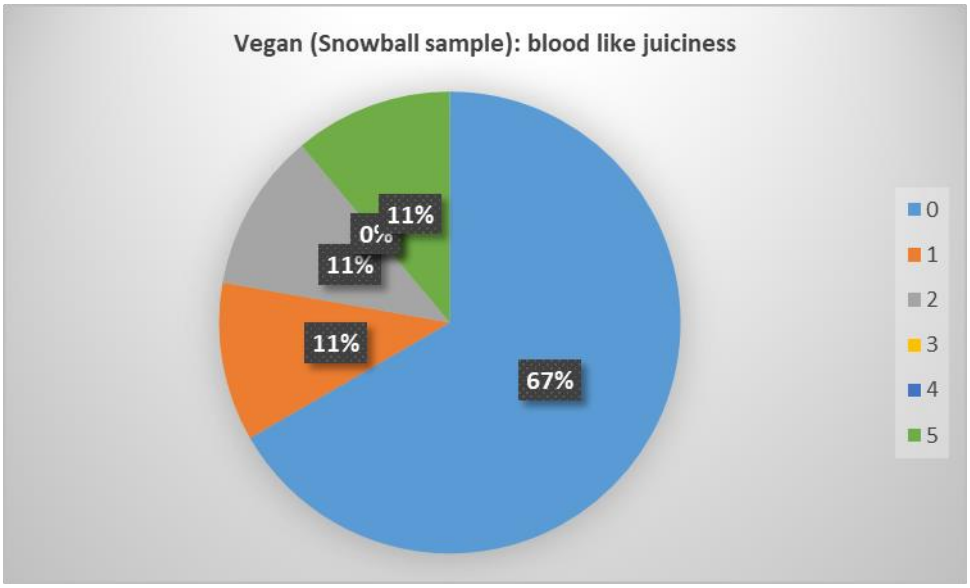

Figure 5.14 Vegan (Snowball sample): Blood-like juiciness for plant-based meat alternatives

From Figure 5.14, it is seen that more than majority of the vegan group from snowball sample have selected level 0 for blood-like juiciness. While level 1, 2 and 5 received 11% for the blood-like juiciness of plant-based meat alternatives. However, level 3 and 4 had no responses.

There were no responses from the interviews on blood-like juiciness of plant-based meat alternatives.

Prolific sample

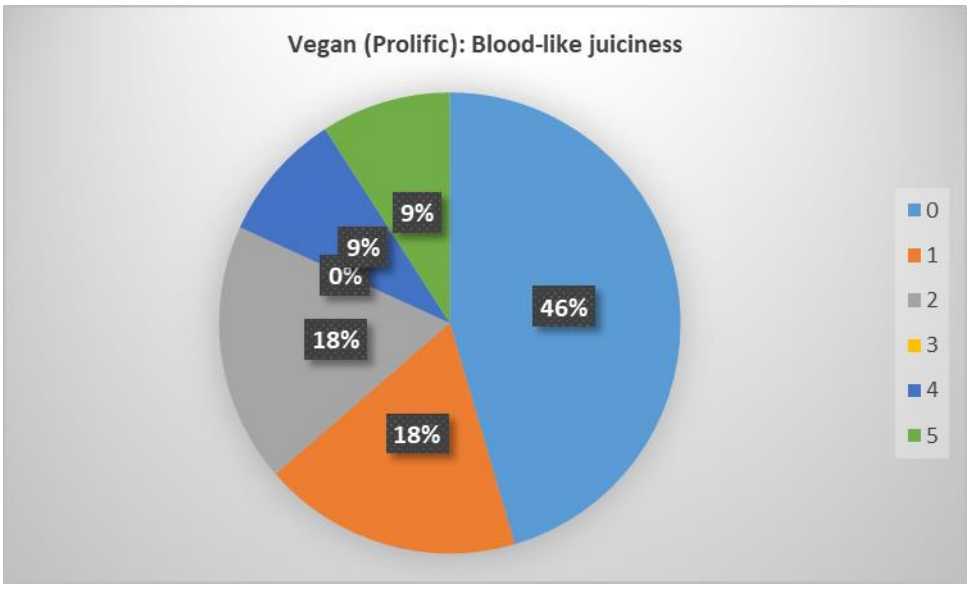

Figure 5.15 Vegan (Prolific): Blood-like juiciness for plant-based meat alternatives

In Figure 5.15, close to majority, 46% selected level 0 for blood-like juiciness. While 18% selected level 1 and level 2 respectively and 9% for level 4 and 5 respectively. With no response for level 3.

From the two charts it is evident that a high percentage of vegans would not like their burgers to bleed. Further, the snowball sample has a majority that is keen on elimination of bleed burgers, however the responses are more varied from the anonymous or Prolific sample.

Meat-like smell

Snowball sample

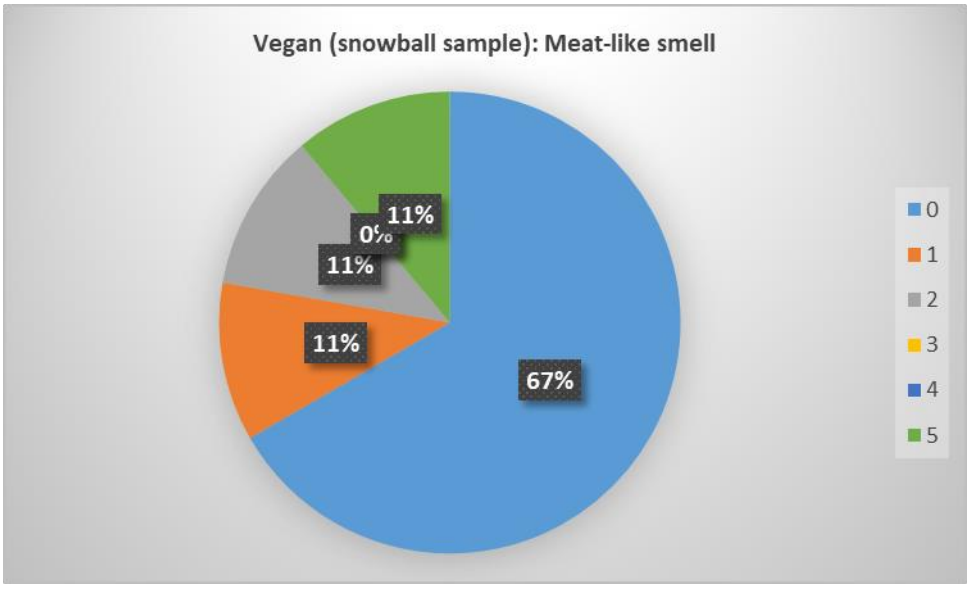

Figure 5.16 Vegan (Snowball sample): Meat-like smell

From Figure 5.16, it is seen that more than majority of the vegan group from snowball sample have selected level 0 for meat-like smell. While level 1, 2 and 5 received 11% for the meat-like smell of plant-based meat alternatives. However, level 3 and 4 had no responses.

Prolific sample

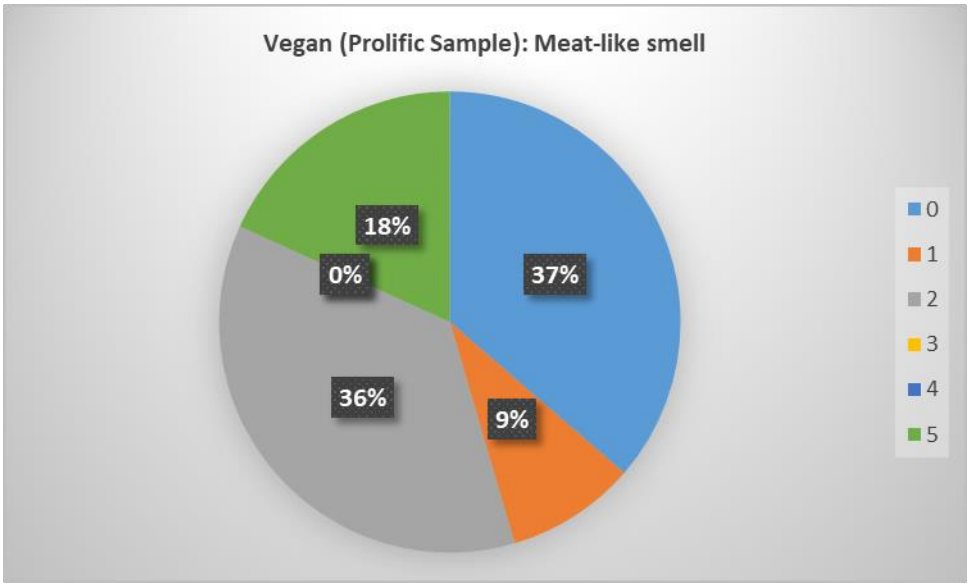

Figure 5.17 Vegan (Prolific Sample): Meat-like smell

From Figure 5.17, 37% of respondents selected level 0 for meat-like smell, while 9% selected 1, 36% selected 2 and 18% selected 5. While there was no response for level 3 and 4.

The vegan group has differing results for meat-like smell from Prolific and snowball sample and the opinion regarding meat-like smell varies. Overall, the vegan group has varying results for meat-like taste, meat-like look, meat-like texture and meat-like smell. However, the majority groups from both Snowball sample and Prolific sample do not prefer if their plant-based meat alternatives bleed.

5.3.2 Vegetarians

Meat – like taste

Snowball sample

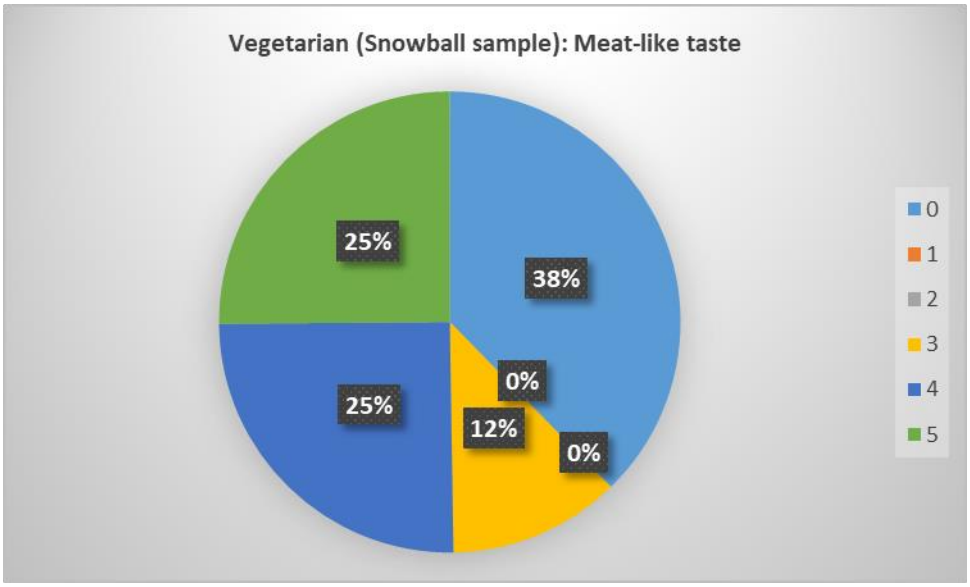

Figure 5.18 Vegetarian (Snowball sampling): Meat-like taste

From Figure 5.18, it is represented that 38% of vegetarians gave level 0 or least importance to meat-like taste of plant-based meat alternatives, while 12% chose level 3 and 25% chose level 4 and 5 each, for 50% of respondents, meat like taste has high importance. While there were no responses from levels 0 and 1.

From the qualitative interviews, R9 who has had a consistent dietary preference, for her the taste of the plant-based meat patty in a burger was not appealing. She felt that the meaty texture was too unfamiliar and made her feel uncomfortable and could not finish even half a burger. Another vegetarian, R10 concurs, she does not like the taste of some of the products, for example Quorn. She claims that she has not tried the entire range of Quorn, however, she does not like the ones that mimic sausages or "tikkas" with no meat. Neither does she like the taste of the products that don't mimic meat. When she has time, she prefers to make her own patties or veggie alternatives at home.

Prolific

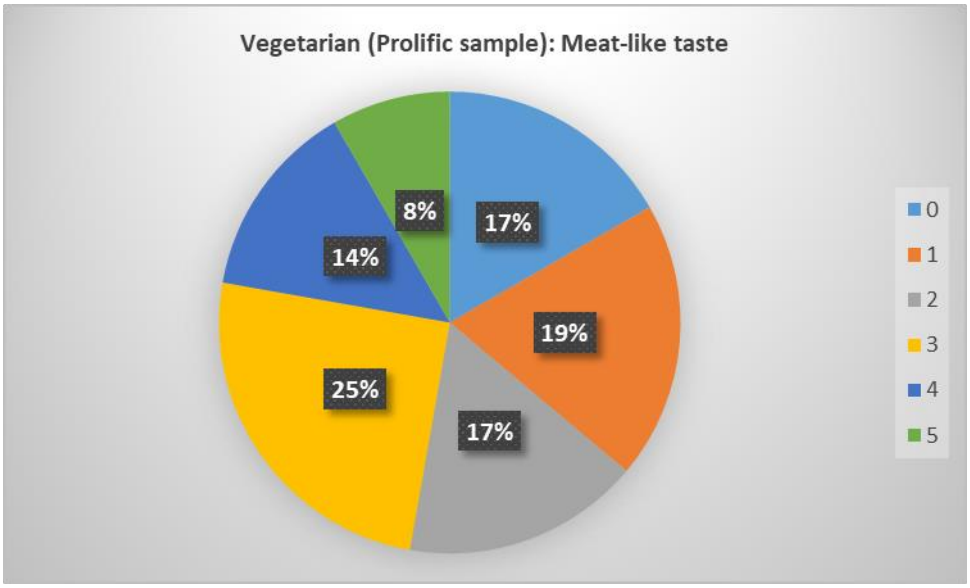

Figure 5.19 Vegetarian (Prolific sample): Meat-like taste

Figure 5.19 illustrates that 14% chose level 0 and level 1 each. 24% chose level 2, 29% chose level 3. While 14% chose level 4 and 5% chose level 5. A higher degree of variation is seen.

From the quantitative surveys, a larger percentage of the vegetarians gave more or most importance to the meat-like taste of plant-based meat alternatives. While the opinion of the vegetarian respondents from the snowball sample varied, while one liked the meat-like taste and other didn't.

Meat – like look

Snowball sample

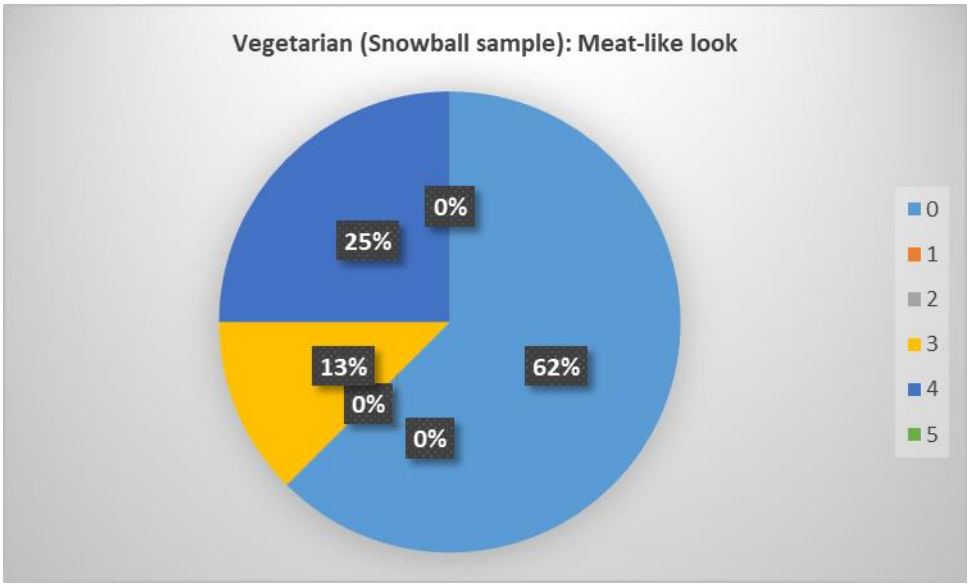

Figure 5.20 Vegetarian (Snowball sample): Meat-like look

From Figure 5.20, 62% of the vegetarians chose level 0 for meat like look. While, 13% chose level 3 and 35% chose level 4. There were no responses for levels 1, 2 and 5. By a clear majority, vegetarians do not give any importance to the meat-like look of plant-based meat alternatives.

From qualitative excerpts, R9, a vegetarian, although the taste was unbearable, she did not mind the visuals of the product. Another vegetarian, the visual appeal was good although the other sensory experiences were not as good for her.

Prolific sample

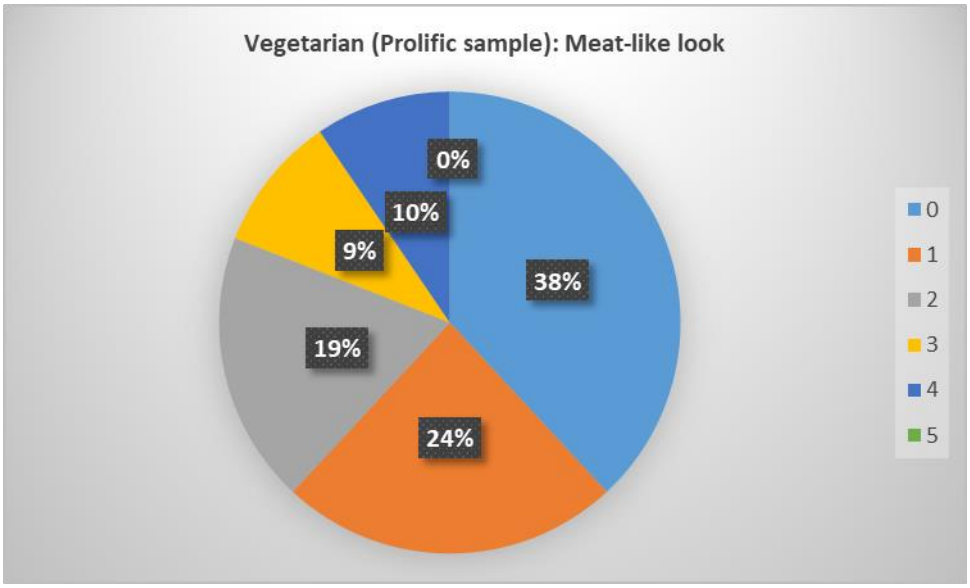

Figure 5.21 Vegetarian (Prolific sample): Meat-like look

From Figure 5.21, it is illustrated that 38% of the Prolific sample, chose level 0, 24% chose level 1, 19% chose level 2, 9% chose level 3 and 10% chose level 4. While there were no responses for level 5.

In this case, more than the majority of snowball sample of vegetarian group gave no importance to meat-like look of plant-based meat alternatives. While, the highest percentage of the Prolific group gave no importance to the meat-like look, however the other levels varied for both samples.

Meat-like texture

Snowball sample

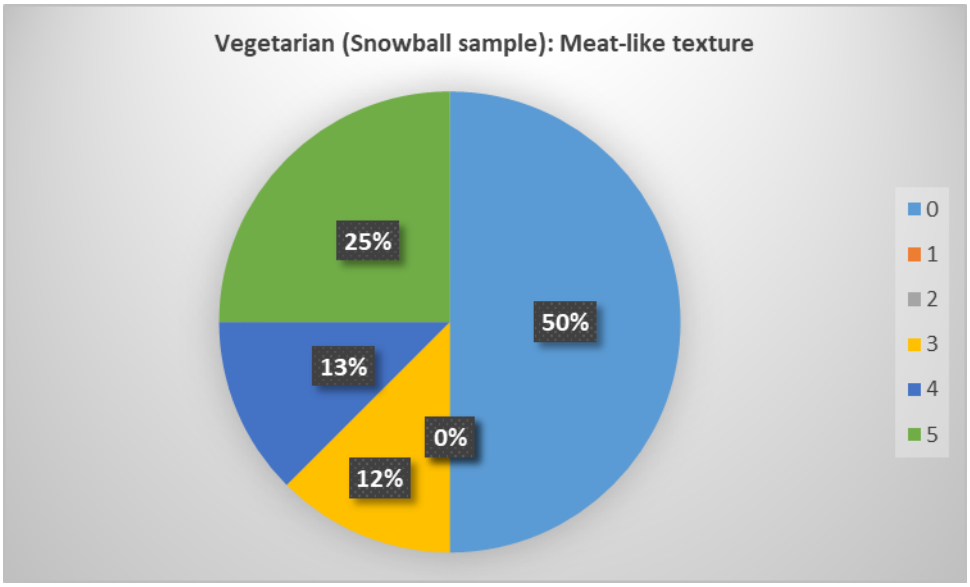

Figure 5.22 Vegetarian (Snowball sample): Meat-like texture

From Figure 5.22, it is noted that the vegetarian group 50% gave no importance to meat-like texture of plant-based meat alternatives, while 12% gave it level 3, 13% gave it level 4 and 25% gave it level 5. With no responses for level 1 and 2.

From the interviews, R5, a vegetarian considers herself to be a picky eater and claims that the sensory experience depends on the product. She does not like fillets and finds them to be bland or dry. "I like sausages only when they are accompanied by mash in a burger" (Interview notes). Moreover, with mince in a shepherd's pie, Quorn bites and pieces and it depended on the product and how it's seasoned. While another vegetarian, R9 thought that the burger patty was too meaty and could not finish even half of her burger.

Prolific sample

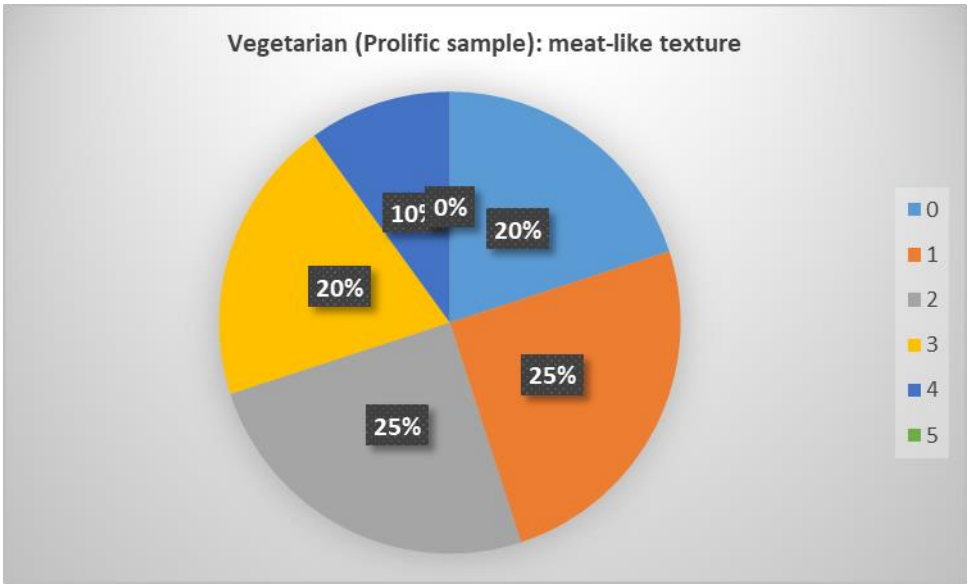

Figure 5.23 Vegetarian (Prolific sample): Meat-like texture

From Figure 5.23, it is observed that 20% rates meat-like texture at level 0, 25% at level 1 and 2 each, 20% at level 3 and 10% at level 4. While there were no responses for level 5.

In comparison, the snowball sample is split in the middle, while a majority percentage from the Prolific sample give higher or highest importance to the meat-like texture of plant-based meat alternatives, an important difference between the two samples. In total, a larger percentage or more than majority of vegetarians gave low or least importance to meat-like texture. While from the interviews, one of the vegetarians dislikes the meaty texture and another enjoys the texture of some brands.

Blood-like juiciness

Snowball sample

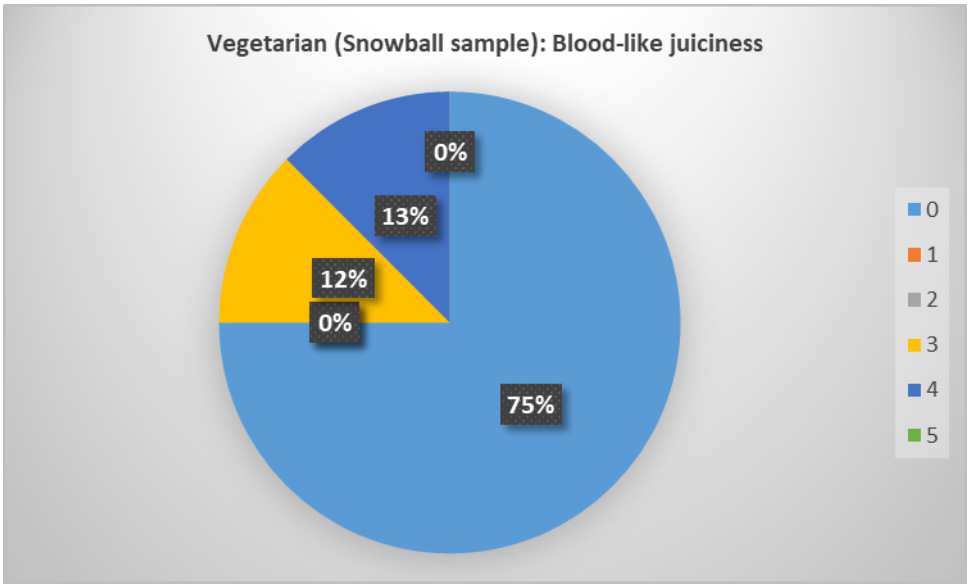

Figure 5.24 Vegetarian (Snowball sample): Blood-like juiciness

From Figure 5.24, 75% of the vegetarians gave level 0 to blood-like juiciness of plant-based meat alternatives, while 12% gave level 3 and 13% gave level 4 to the bloodiness of the products. While there were no responses for levels 1, 2 and 5.

There were no responses from interviews on this factor.

Prolific sample

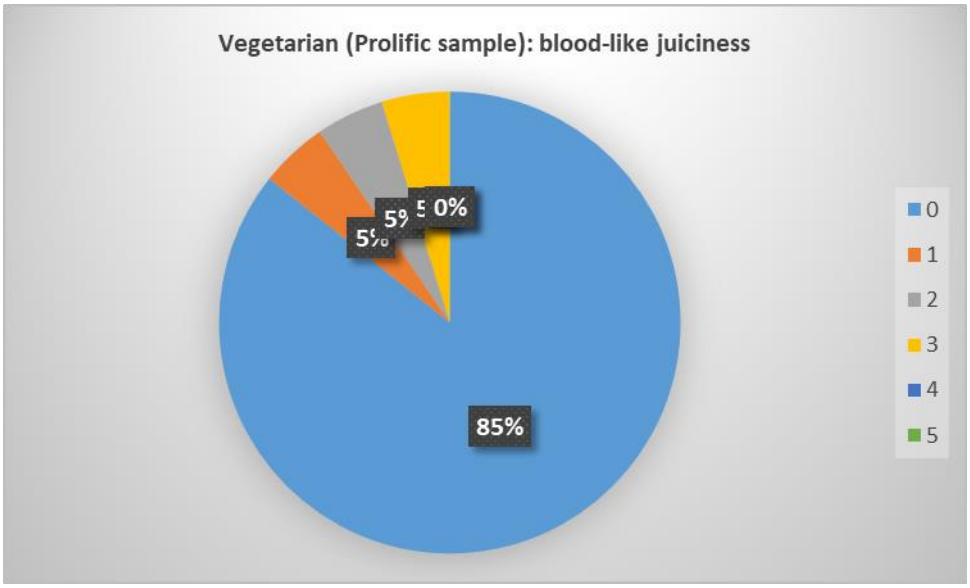

Figure 5.25 Vegetarian (Prolific sample): Blood-like juiciness

In Figure 5.25, a majority of 85% chose level 0 for blood-like juiciness of the product. While levels 1, 2 and 3 were chosen by 5% each. While there was no response for level 4 and 5.

In this case, by far the majority in both cases gave no importance to blood-like juiciness of plant-based meat alternatives and would prefer if they did not bleed.

Meat-like smell

Snowball sample

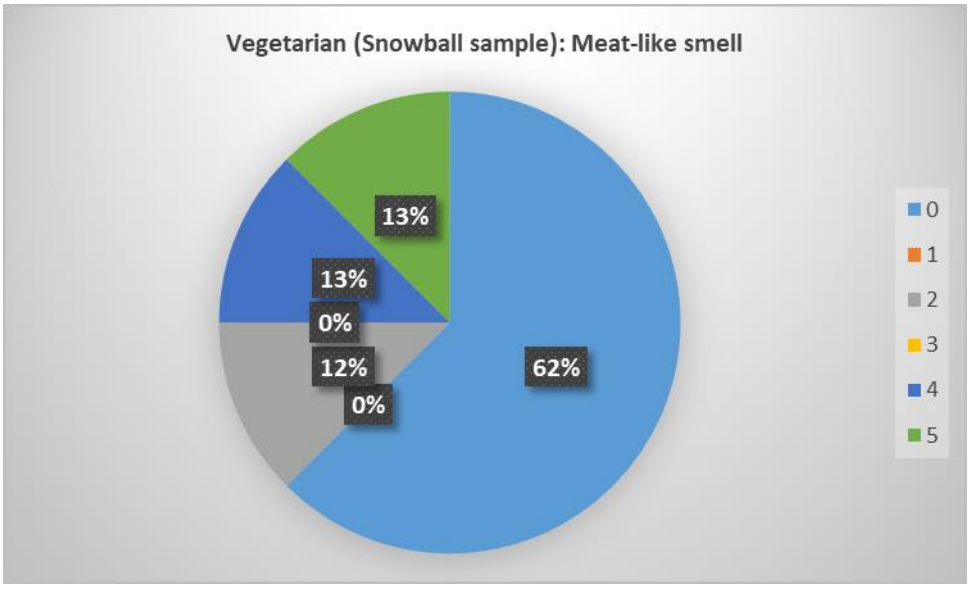

Figure 5.26 Vegetarian (Snowball sample): Meat-like smell

In Figure 5.26, 62% of the snowball sample gave meat-like smell a rating of 62%. While 12% gave level 2, 13% gave levels 4 and 5 respectively. While there was no response for levels 1 and 3. There were no responses from interviews.

Prolific sample

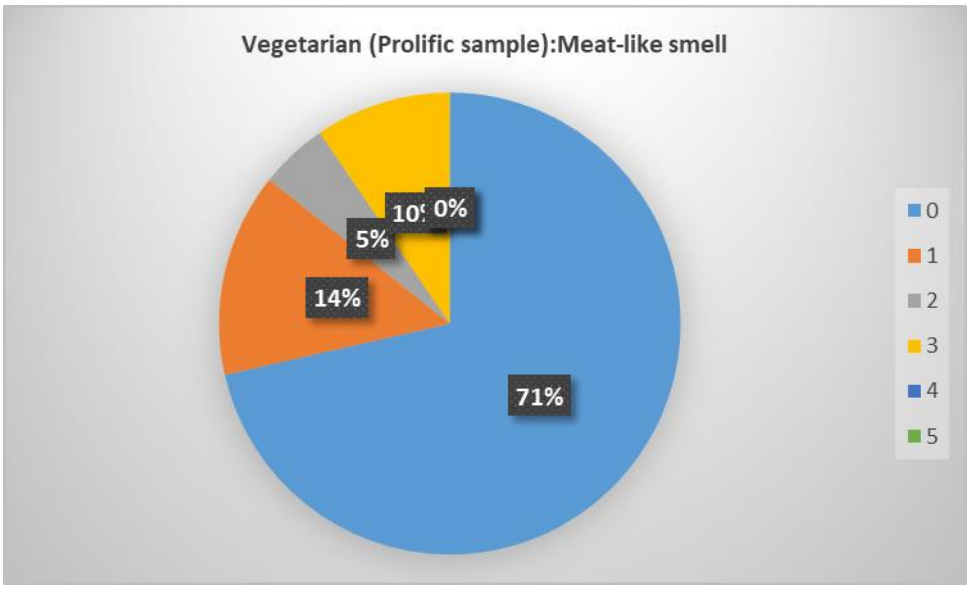

Figure 5.27 Vegetarian (Prolific sample): meat-like smell

From Figure 5.27, 71% of the vegetarians gave level 0 of importance to meat-like smell of plant-based meat alternatives. While, 14% gave level 1, 5% gave level 2, and 10% gave level 3. While there were no responses for levels 4 and 5.

From both samples, the majority does not give any importance to meat-like smell of plant-based meat alternatives and would not prefer if the products smelt like meat. While the percentages for other levels vary. From the interviews, a vegetarian, R9 was indifferent towards the smell of the product.

For the vegetarian group, their opinions from the Prolific and snowball sample varied for meat-like taste, meat-like look and meat-like texture. However, both samples had vegetarians had majorities that did not want their plant-based meat analogues to bleed like meat or smell like meat.

5.3.3 Flexitarians

Meat – like taste

Snowball sample

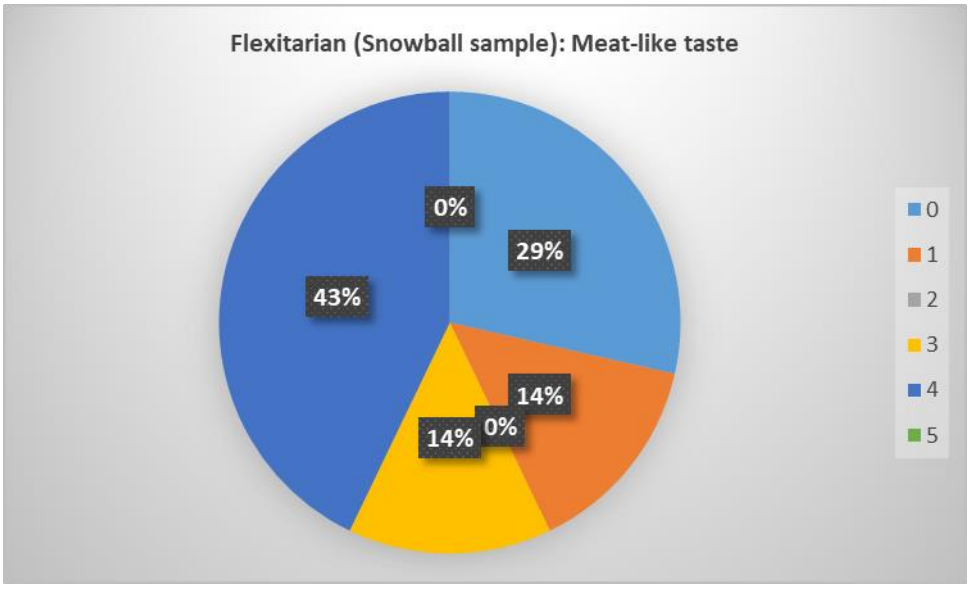

Figure 5.28 Flexitarian group (Snowball sample): Meat-like taste of plant-based meat alternatives

From Figure 5.28, it is observed that 29% of flexitarians rated meat-like taste as level 0, 14% chose level 1 and 3 each and 43% chose level 4. While there were no responses for level 2 and 5.

The interviews revealed that one flexitarian, R1 says that "with one bite you know if it's a veggie patty or a plant based meat alternative or a meat burger" (Interview notes). Although, it is interesting when he and his partner tried a Beyond Meat burger, he thought it definitely tasted like a meat patty. His partner is vegan and she didn't like that it was so close to meat. Our respondent had to finish his partner's burger for her.

Prolific

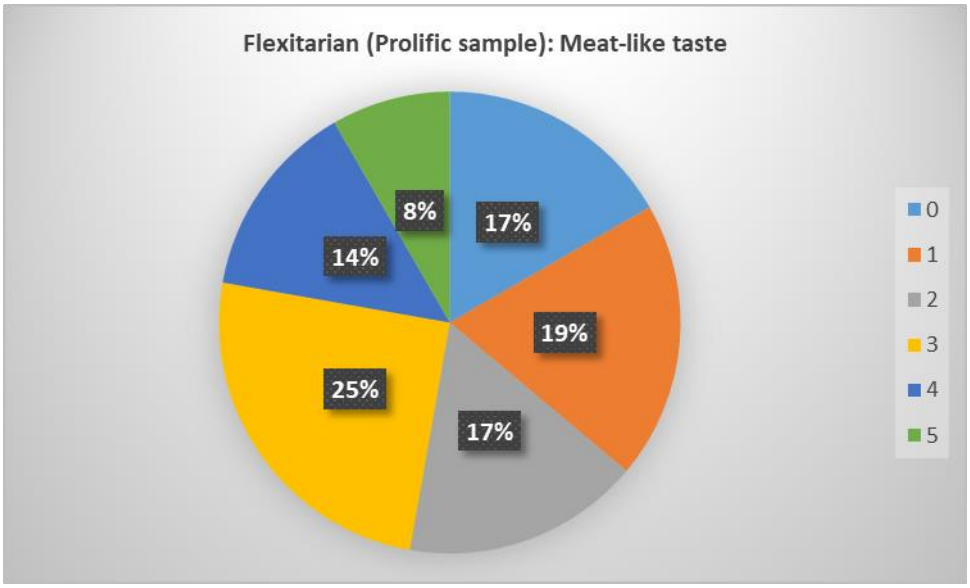

Figure 5.29 Flexitarian group (Prolific sample): Meat-like taste of plant-based meat alternatives

From Figure 5.29, it is seen that 17% of the flexitarians selected level 0 for meat-like taste of plant-based meat alternatives, while 19% selected level 1, 17% selected level 2, 25% chose level 3, 14% selected level 4 and the lowest at 8% chose level 5.

Comparing the two samples, the results do not depict a majority for any of the levels of meat-like taste of plant-based meat alternatives. There were no respondents who chose most importance for meat-like taste from snowball sample and only 8% rated meat-like taste as most important from Prolific sample. From the literature review, it was noted that meat alternative companies are targeting flexitarians, a newly converted group that is trying vegetarian or vegan diets would prefer a familiar meat-like taste (Apostolidis and McLeay 2016). Therefore, flexitarians from this study do not prefer a meat-like taste debunking the strategy of plant-based meat alternative brands.

Meat – like look

Snowball sample

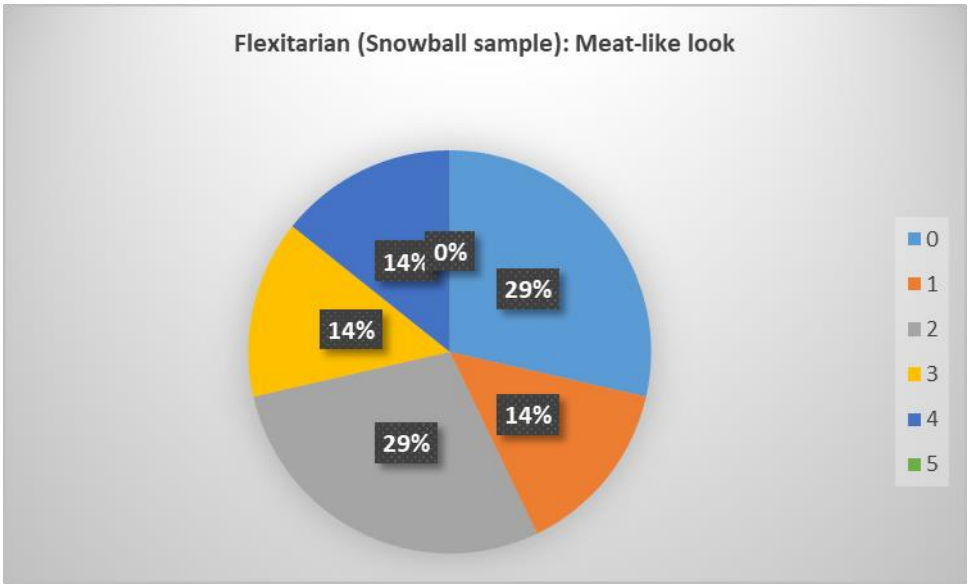

Figure 5.30 Flexitarian group (Snowball sample): Meat-like look

From Figure 5.30, it is seen that 29% of the flexitarians rated meat-like look of plant-based meat alternatives at 0, 29% chose level 2, 14% chose levels1, 3 and 4 each. While there were no responses for level 5.

No response from interviews on this factor.

Prolific sample

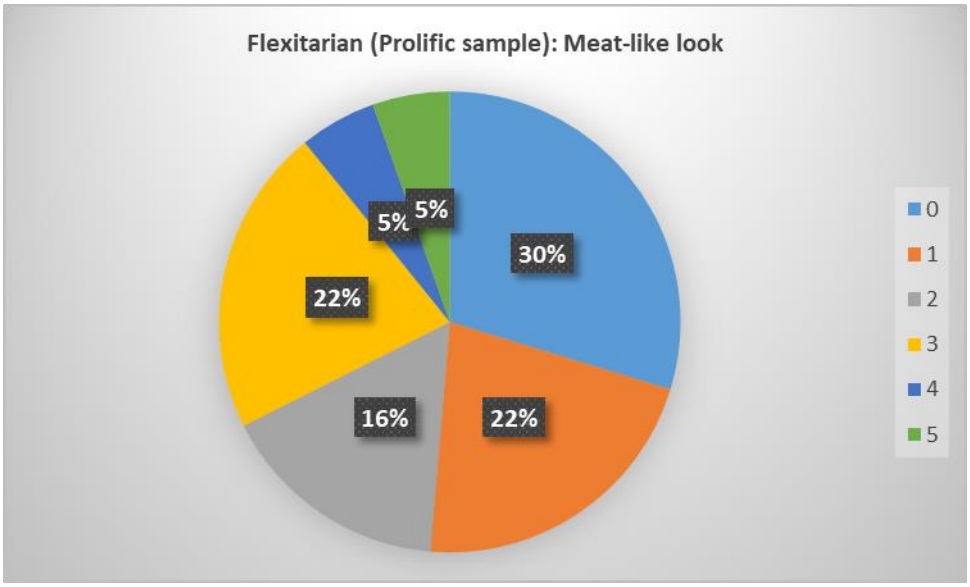

Figure 5.31 Flexitarian (Prolific sample): Meat-like look

From Figure 5.31, it is observed that 30% of the flexitarians rated meat-like look of plant-based meat alternatives at 0, while 22% chose levels 1 and 3 each, 16% chose level 2, 5% chose levels 4 and 5 each.

In this case, the levels of percentage of importance to meat-like look vary to a large extent, although a larger percentage of flexitarians choose that the meat-like look is not important. Plant-based meat companies target flexitarians and have created their products to have an uncanny resemblance to meat (Hoek et al. 2011). However, in this case, flexitarians do not give as much importance to the meat-like look of the products, thereby their strategy is not as successful.

Meat-like texture

Snowball sample

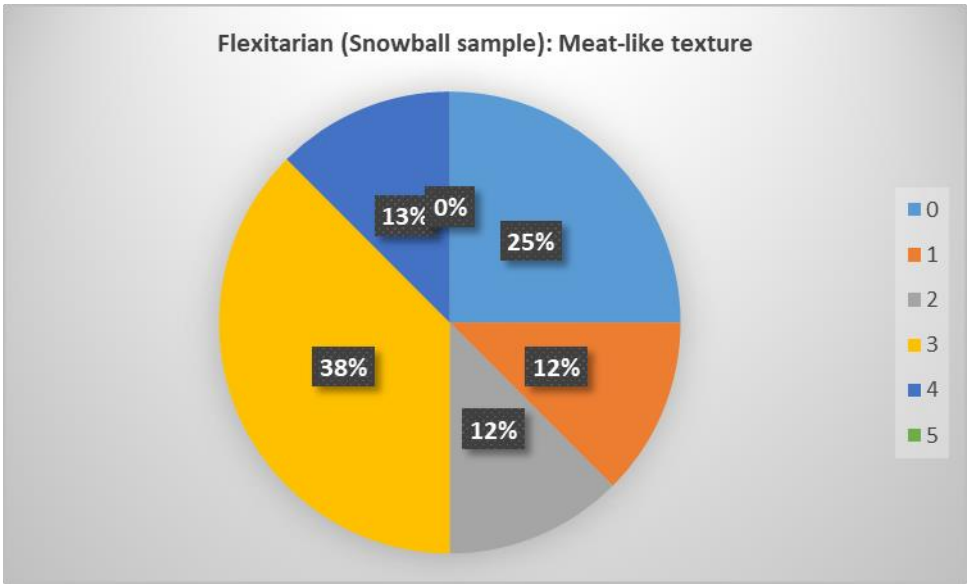

Figure 5.32 Flexitarian group (Snowball sample): Meat-like texture

From Figure 5.32, 25% of the flexitarians from the Snowball group rated importance of meat-like texture of plant-based meat alternatives at 0, while 12% chose levels 1 and 2 each, 38% chose level 3 and 13% chose level 4. There were no respondents for level 5.

From the interviews, R11: a flexitarian tries to recreate specific dishes with plant-based meat alternatives such as Toad in the hole or Yorkshire pudding with sausages or perhaps a Mapo Tofu. He enjoys the texture of an alternate mince product but claims that do not have the same kind of fattiness that meat products have and texture is lacking in comparison to meat. "I would

say that I have tried a lot of the different plant based foods that are around or have emerged over the last five years or Quorn for 20 years. But they haven't got those textures yet and are trying to replicate the texture or feeling of meat" (Interview notes). Even though tofu is a product that was initially believed to be consumed by vegans and vegetarians, the flexitarian R11 consumes it, not only is he dissatisfied with tofu but also with Quorn.

Prolific sample

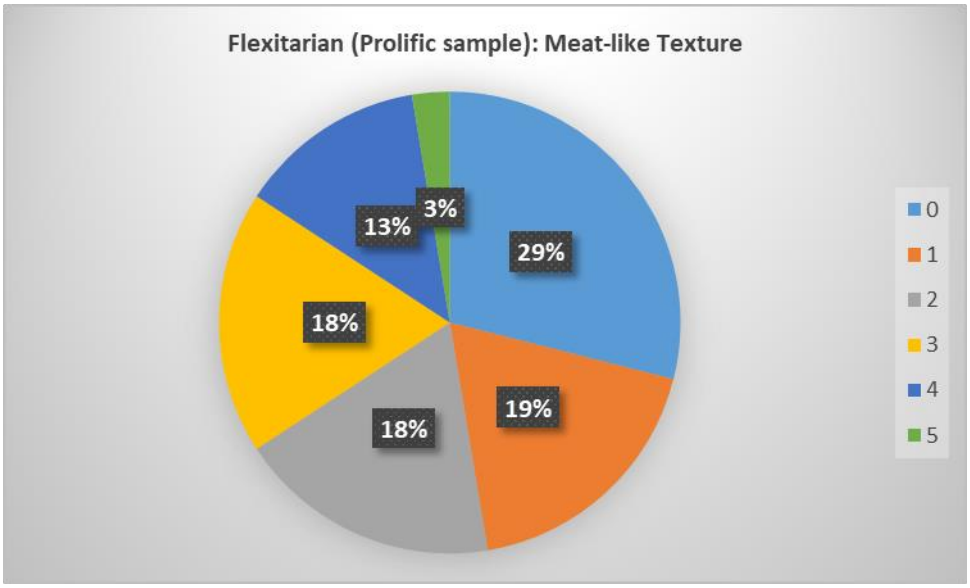

Figure 5.33 Flexitarian group (Prolific sample): Meat-like texture

From Figure 5.33, it is seen that 29% of the Prolific flexitarian group chose level 0, 19% chose level 1, 18% chose level 2 and 3, 13% chose level 4 and 3% chose level 5.

The two samples from the flexitarian group have varying responses pertaining to the importance of meat-like texture of plant-based meat alternatives. However, from the interviews one flexitarian respondent is deeply disappointed in the texture and says that the companies have not accomplished a similar texture to meat as yet. Fewer flexitarians from the survey gave a lot of importance to meat-like texture, again the approach of plant-based meat alternatives will need revision.

Blood-like juiciness

Snowball sample

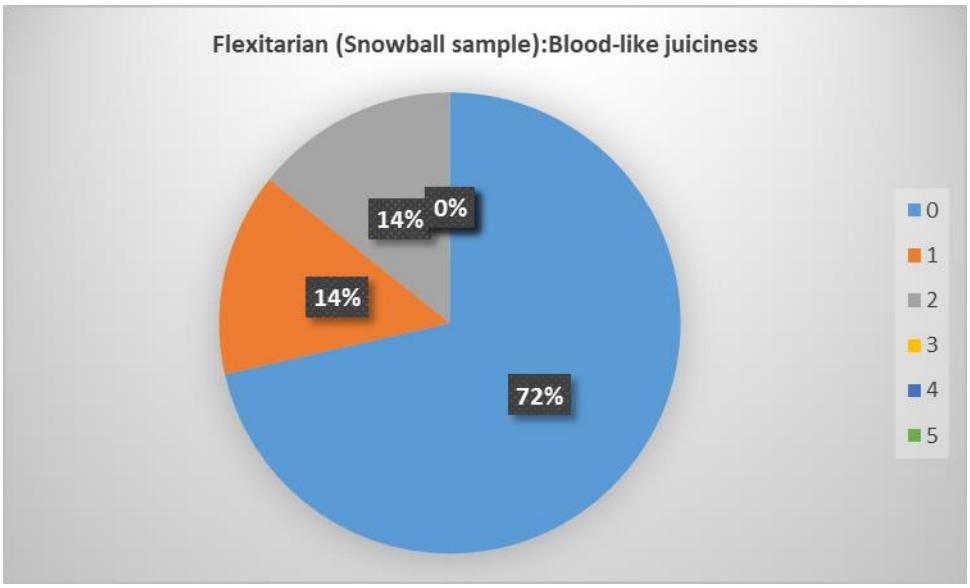

Figure 5.34 Flexitarian (Snowball sample): Blood-like juiciness

From Figure 5.34, the snowball sample of the flexitarian group, 72% of the respondents chose level 0 for the bloodiness of the plant-based meat alternatives. While, 14% chose levels 1 and 2. There were no responses for levels 3, 4 and 5. From the interviews, R12, a flexitarian was disgusted by the bloodiness aspect of the patties

Prolific sample

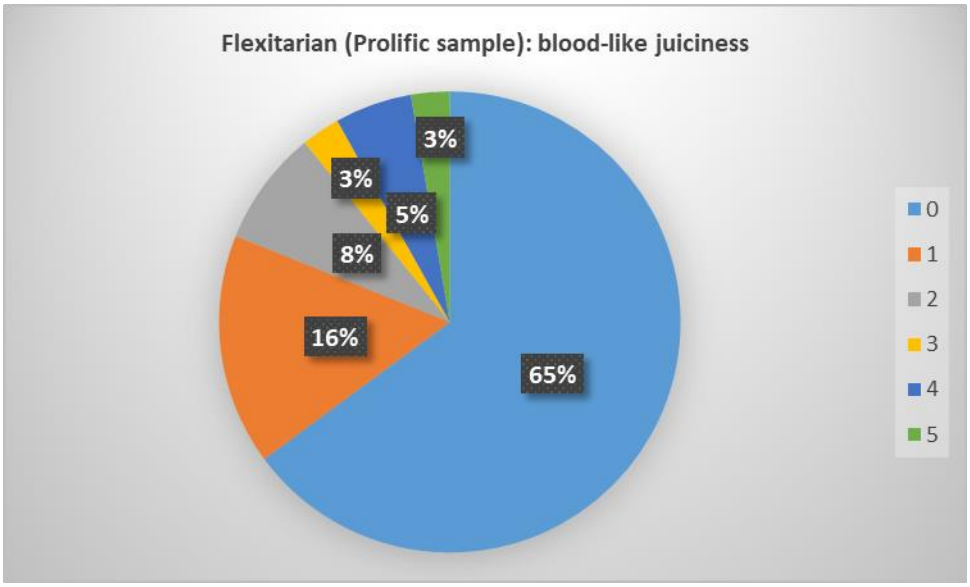

Figure 5.35 Flexitarian (Prolific sample): blood-like juiciness

From Figure 5.35, 65% of the respondents rated blood-like juiciness of plant-based meat alternatives at 0, 16% chose level 1, 8% chose level 2, 3% chose 3 and 5.

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In this case, more than majority of the snowball group and for Prolific group, gave low or least importance to blood-like juiciness of plant-based meat analogues and a majority would not want plant-based meat alternatives to bleed. The priorities of plant-based meat companies, especially Beyond Meat and Impossible Foods that use beetroot juice and recreates heme iron respectively, as mentioned earlier to give plant-based meat products a blood-like look and feel is in ineffective.

Meat-like smell

Snowball sample

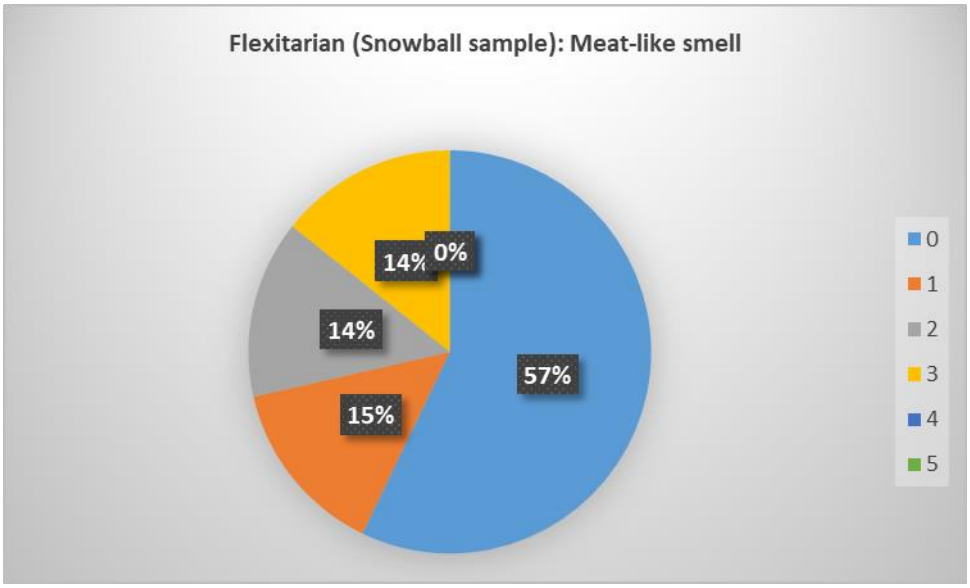

Figure 5.36 Flexitarian (Snowball sample): Meat-like smell

From Figure 5.36, 57% of the respondents rated level 0 for meat-like smell, 15% chose level 1, 14% selected level 2 and level 3 each. While there were no responses for levels 4 and 5. There was no response from the interviews regarding this factor.

Prolific sample

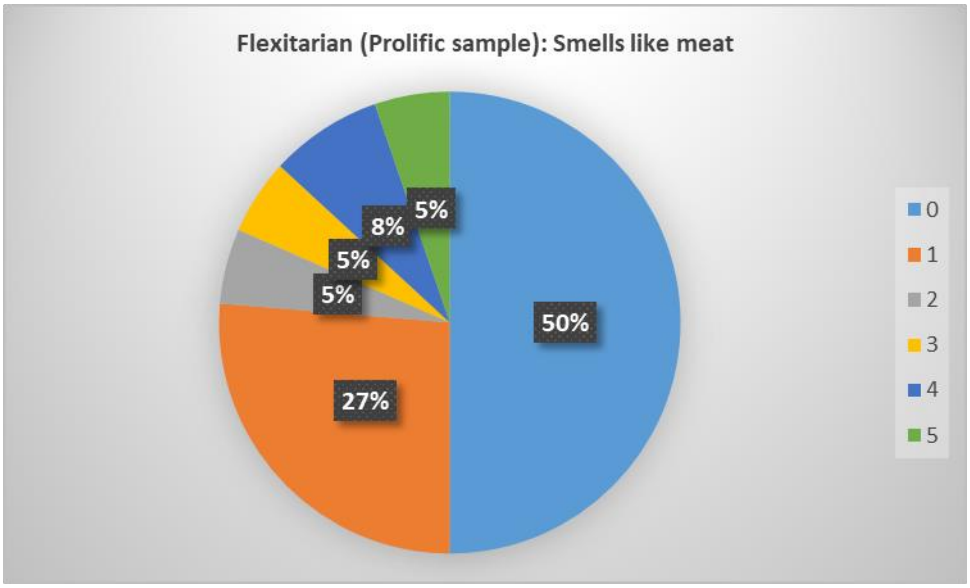

Figure 5.37 Flexitarian (Prolific sample): Meat-like smell

From Figure 5.37, 50% of the flexitarian group rated meat-like smell at level 0. While 27% rated it at level 1, 5% at levels 2, 3 and 5 and 8% at level 4. More than majority group of flexitarians gave low or least importance to meat-like smell of plant-based meat alternatives.

In conclusion, there are feelings of fondness for some and feelings of revolt and disgust for others regarding the meat-like taste of plant-based meat alternatives. One of the flexitarian craves the texture of meat and feels that plant-based meat alternatives could improve their texture to feel more like meat. One respondent found the blood-like juiciness of patties to be disgusting. While the first respondent feels that plant-based meat alternatives have a long way to reach the meat-like texture of meats. While, the flexitarian group did not respond to meat-like look or meat-like smell in the interviews. Overall, the flexitarian groups does not give that much importance to meat like similarities of plant-based meat alternatives, especially not to blood-like juiciness. Thereby iterating that plant-based meat alternative companies need to revisit their strategies to make their products more suitable for flexitarians.

5.3.4 Omnivore group

Meat – like taste

Snowball sample

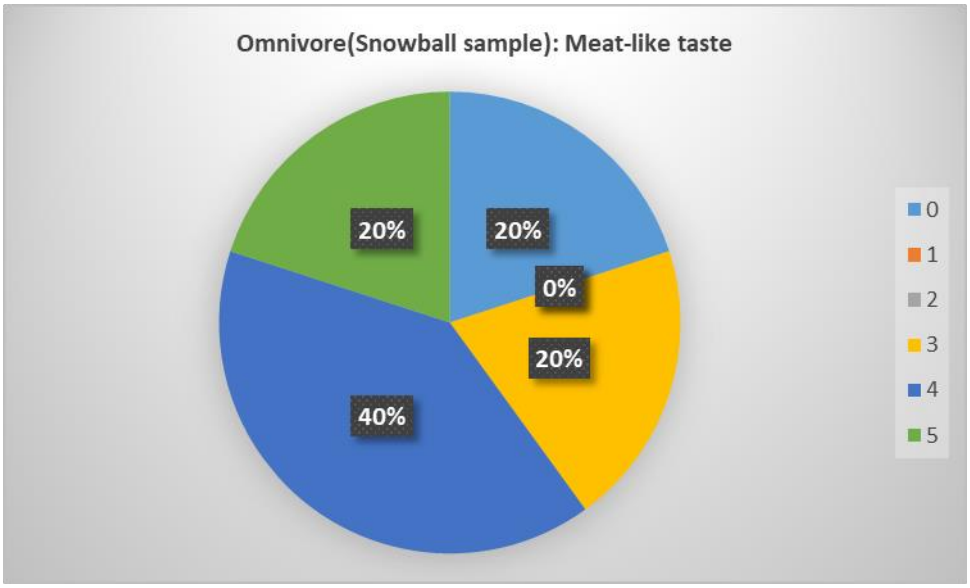

Figure 5.38 Omnivore group (Snowball sample): Meat-like taste

From Figure 5.38, it is illustrated that 20% of omnivores selected levels 0 of importance of meat-like taste for omnivores. While, 20% selected levels 3 and 5 each as well and 40% selected level 4, 60% of the majority of omnivores gave high preference to meat-like taste. There was not response for level 1 and 2.

From interviews by participants from snowball sample, the omnivores have contrasting opinions. For R3 the products taste very different from meat, he feels that meat options are much more palate enticing or tingling in comparison to plant-based meat analogues. The main appeal from plant-based meat alternatives for him comes from ethical motives rather than the actual experience that one gets from consuming them. R8, she likes trying new products and is curious about their similarity to meat. "I've started eating seitan. I went to a vegan restaurant in Shoreditch and I try to buy seitan products in supermarkets, although they are very rare". Even though seitan is not a novel plant-based meat alternatives, R8, an omnivore enjoys them. Hence, debunking the claim that earlier plant-based meat alternatives are meant for vegans and vegetarians alone.

Prolific

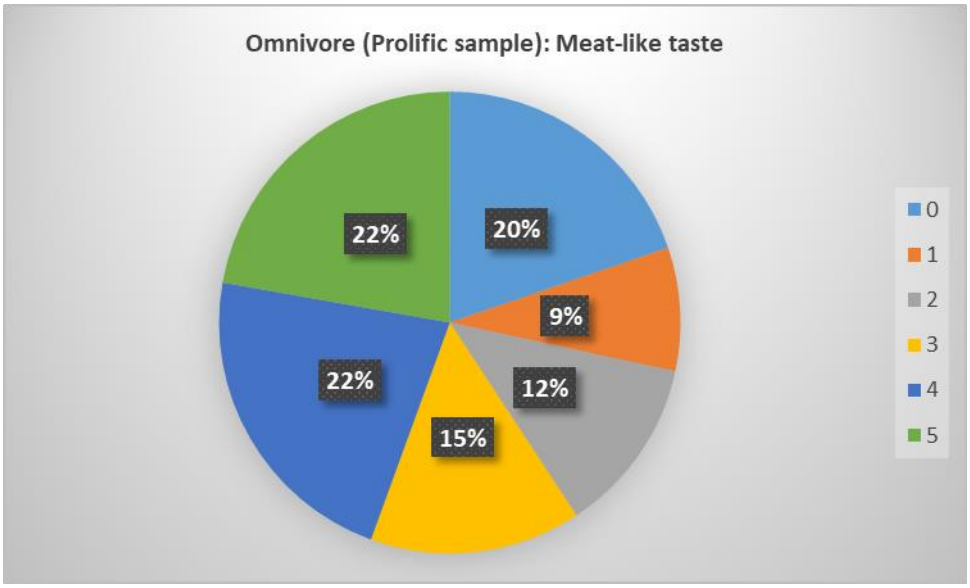

Figure 5.39 Omnivore group (Prolific sample): Meat-like taste

From Figure 5.39, it is observed that 20% of prolific group of omnivores selected level 0 of importance for meat-like taste of plant-based meat alternatives. While, 9% selected level 1, 12% selected level 2, 15% selected level 3 and 22% selected level 4 and 5 each. In this case too majority ranks meat-like taste more important, even though there is higher variation.

In the two cases, the snowball sample has 60% who have selected levels 4 and 5, while 44% have selected levels 4 and 5 from the Prolific sample. Omnivores have a higher preference for meat-like taste of plant-based meat alternatives. Even from the interviews, one omnivore wanted the products to taste more like meat, while another tried them as she was curious to find out how similar they were to meat.

Meat – like look

Snowball sample

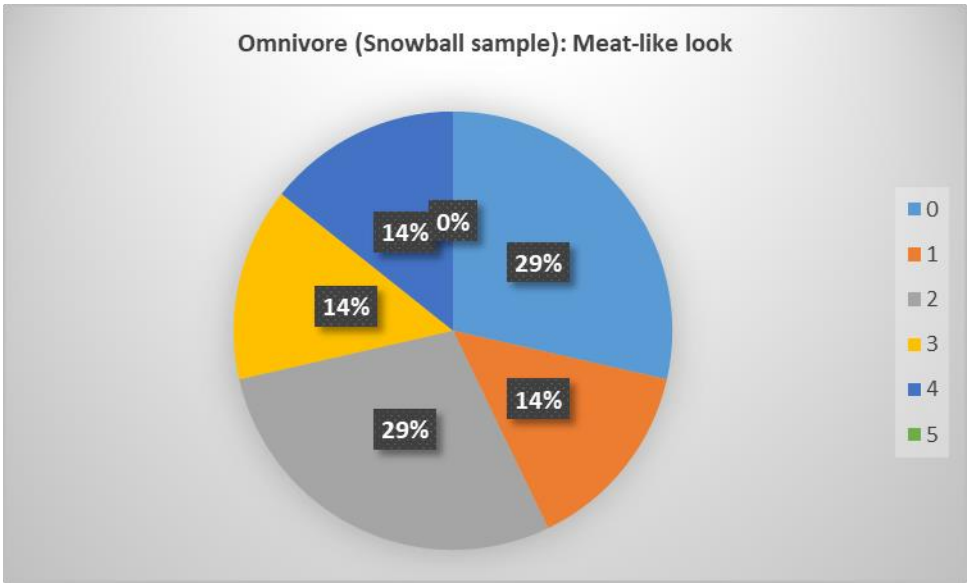

Figure 5.40 Omnivore group (Snowball sample): Meat-like look

From Figure 5.40, the omnivore group from the snowball sample had an equal distribution of importance to meat-like look as 20% chose levels 0, 2, 3, 4 and 5. While there was no response for level 1. From the interviews, an omnivore, R8, "for me personally, if it resembles meat, I always like to try it".

Prolific sample

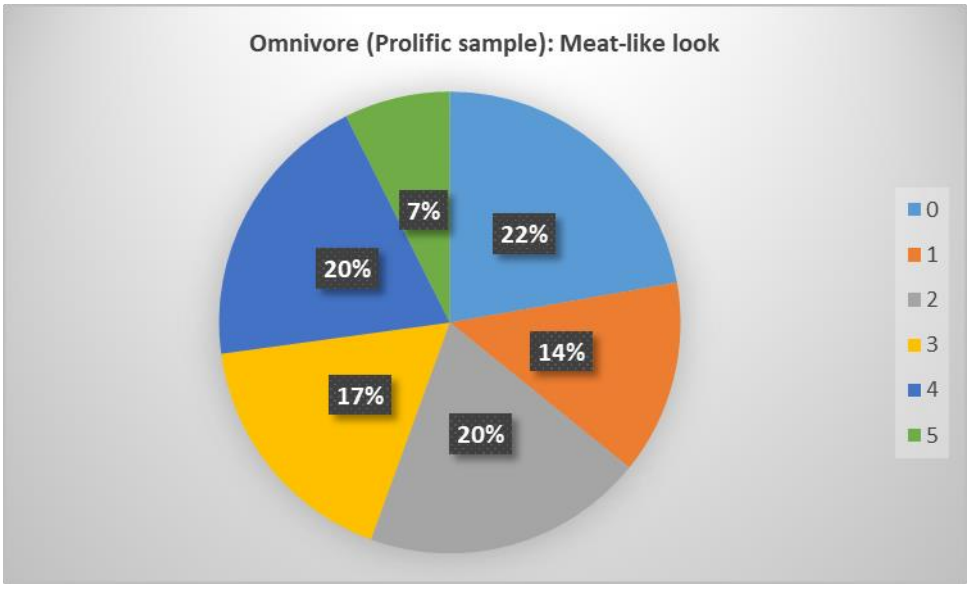

Figure 5.41 Omnivore group (Prolific sample): Meat-like look

From Figure 5.41, it is seen that 22% of the respondents chose level 0 of importance for meat-like look. While 14% chose level 1, 20% chose levels 2 and 4, 17% chose level 3 and 7% or the least percentage chose level 5.

In both cases there is a varied distribution of percentages regarding importance for meat-like look for plant-based meat alternatives, however the majority assigns a lower importance to meat-like look of these products.

Meat-like texture

Snowball sample

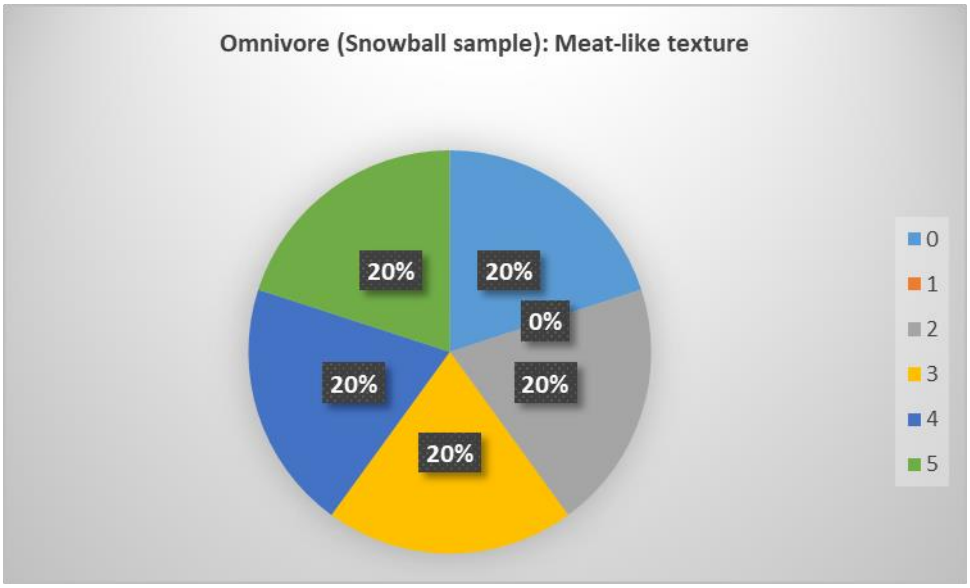

Figure 5.42 Omnivore group (Snowball sample): Meat-like texture

From Figure 5.42, the omnivore group from the snowball sample had an equal distribution of importance to meat-like texture as 20% chose levels 0, 2, 3, 4 and 5. While there was no response for level 1.

From the snowball sample interviews, one of the omnivores, R8 mentioned that she would prefer if the Quorn products could be less dry. Similar to the flexitarian, R11, one the omnivore's R8 is unsatisfied with the texture of Quorn.

Prolific sample

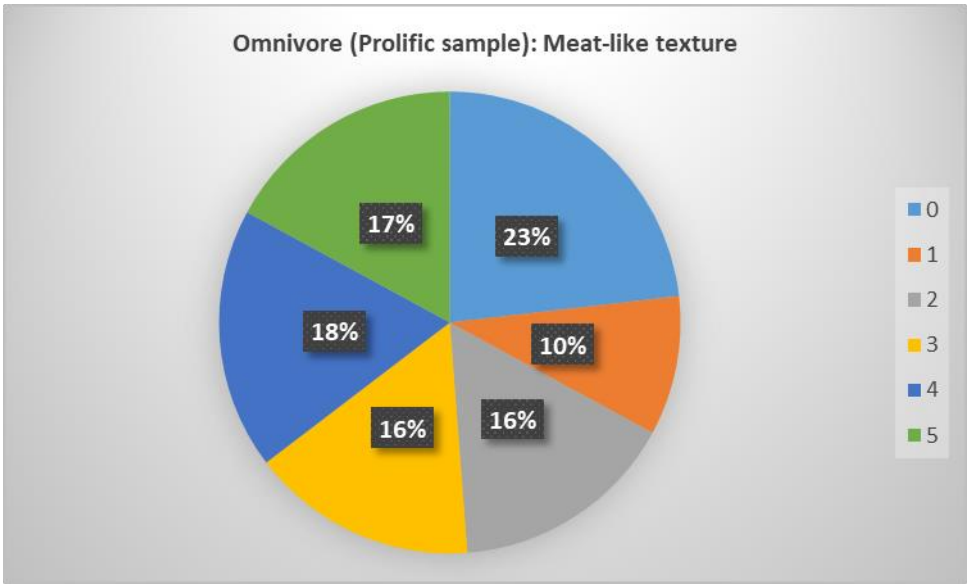

Figure 5.43 Omnivore group (Prolific sample): Meat-like texture

From Figure 5.43, 23% of omnivores from the Prolific group chose level 0, 10% chose level 1, 16% chose levels 2 and 3, 18% chose level 4 and 17% chose level 5.

In both cases, the percentage is distributed unevenly and no trend is visible for meat-like texture for omnivore group.

Blood-like juiciness

Snowball sample

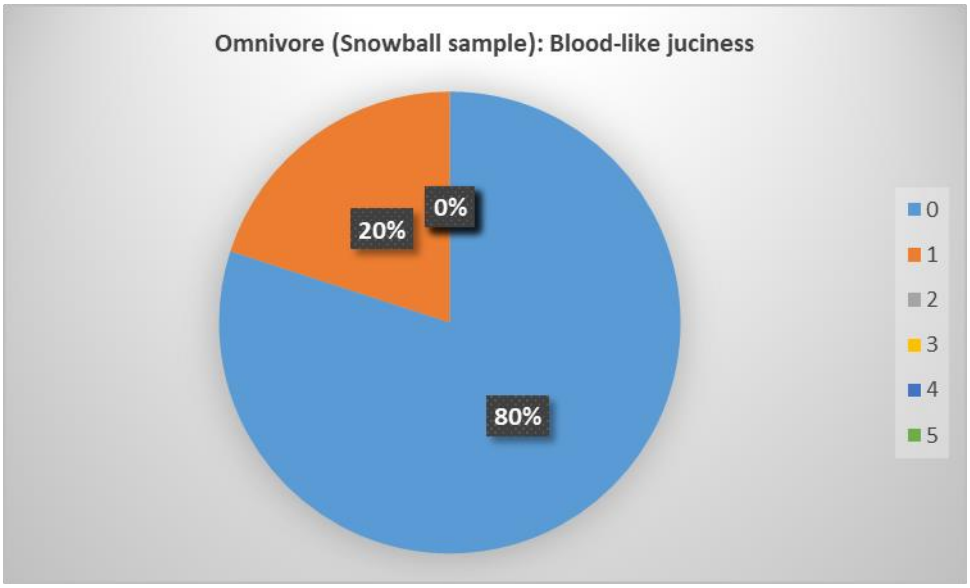

Figure 5.44 Omnivore group (Snowball sample): Blood-like juiciness

From Figure 5.44, it is clear that more than majority at 80% of snowball sample of the omnivore group have selected 0 level of importance of bloodiness of plant-based meat alternatives. While, 20% have chosen level 1.

From the interviews, an omnivore, R8 said that she was not fussed about the blood-like juiciness of the plant-based meat alternative and would care if she was eating a real steak.

Prolific sample

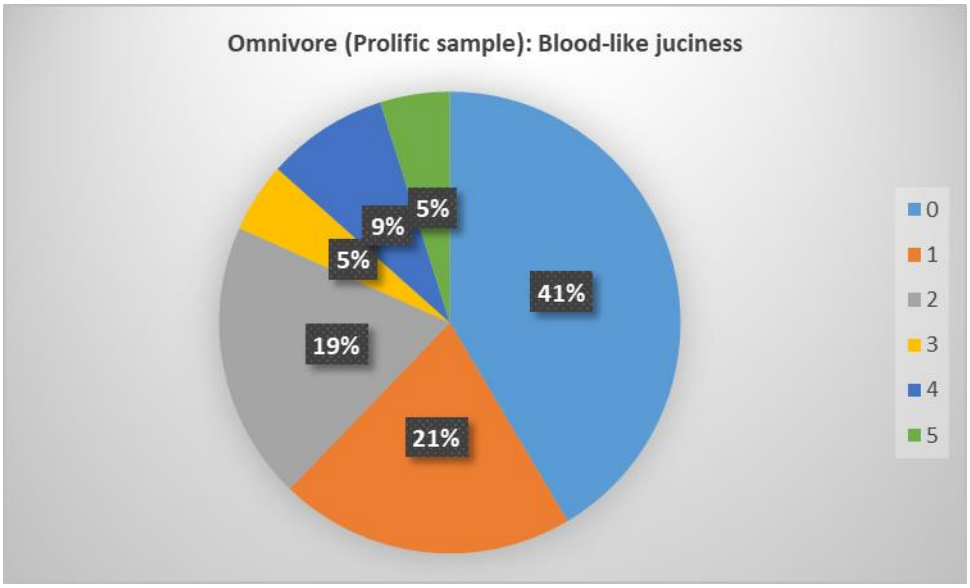

Figure 5.45 Omnivore group (Prolific sample): Blood-like juiciness

From Figure 5.45, it is evident that 41% of the omnivore group from the Prolific sample chose 0 level of importance for blood-like juiciness. While, 21% chose level 1, 19% chose level 2, 5% chose levels 3 and 5 and 9% chose level 4.

In this case, a very large percentage of snowball sample no importance to blood-like juiciness of plant-based meat alternatives. However, the distribution of percentages was more varied for Prolific sample, but a large percentage of 41% preferred if plant-based meat alternatives did not bleed like meat. Omnivores are part of the target group of plant-based meat alternative companies and many might be considering shifts in their diet, although to a lower extent than flexitarians. However, it is surprising to note that even the omnivores do not care much for bleeding plant-based meat alternatives, more evidence for plant-based meat companies to shift strategies.

Meat-like smell

Snowball sample

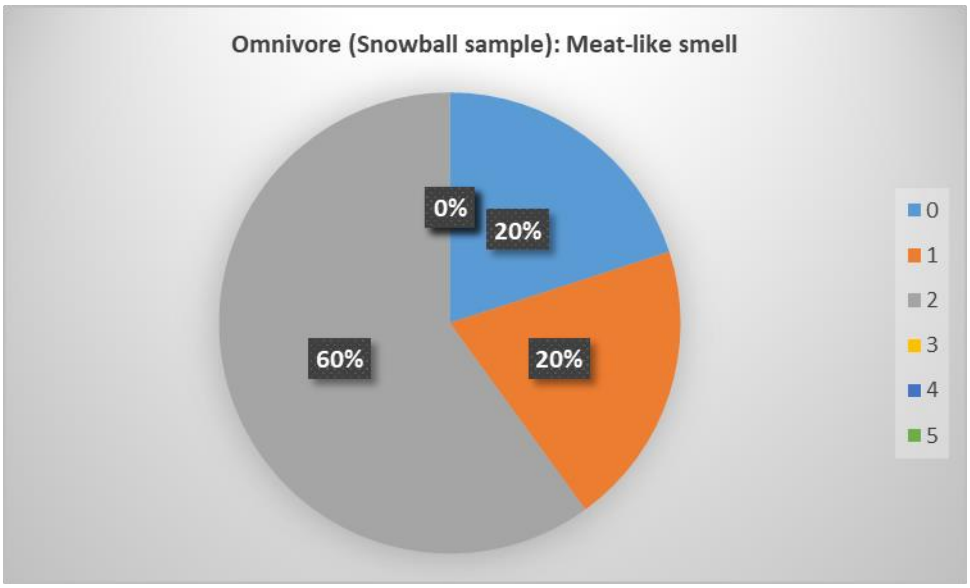

Figure 5.46 Omnivore group (Snowball sample): Meat-like smell

From Figure 5.47, 20% of the omnivores from the snowball sample chose levels 0 and 1 each, while 60% chose level 2. While from the interviews, one of omnivores R3, mentioned that a plant-based meat alternative does not offer the same satisfaction of smell that meat does when it is being prepared/baked or fried.

Further, the omnivores had other relevant comments in the interviews. One of the omnivores mentioned in the survey, "I don't eat much meat, the only reason I do is because of my partner who loves it and we live together and if I am at my parents' house. Otherwise I could live without meat, I am not addicted to it. As I don't feel the need to eat meat, I don't feel the need either to replace it with something else. The times when I do eat it, I prefer to eat meat rather than processed food" (Interview notes). Yet another omnivore mentioned that "Whilst plant-based meat alternatives are stomach-able they are a poor substitute for meat and overall would be eaten for survival rather than enjoyment" (Interview notes). Another omnivore's opinion coincides with the previous respondent, "If I can, I always try meat imitations. So far they were all terrible. Impossible Burger, Beyond Meat, local ones, they are OK, but they feel, taste, smell and look nothing like meat" (Interview notes).

Prolific sample

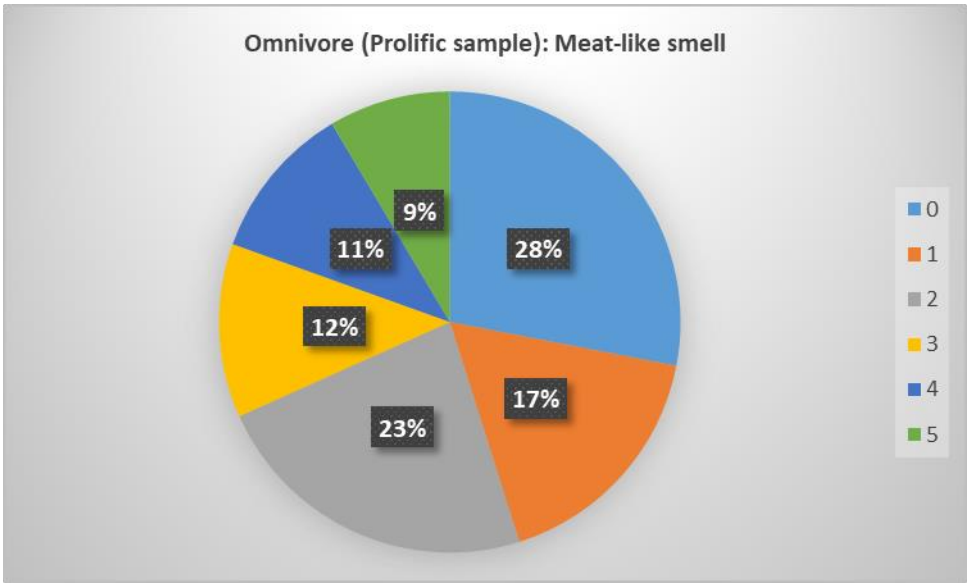

Figure 5.48 Omnivore group (Prolific sample): Meat-like smell

From Figure 5.48, 28% of the omnivores selected importance level 0 of meat-like texture for plant-based meat alternatives. While, 17% chose level 1, 23% chose level 2, 12% chose level 3, 11% chose level 4 and 9% chose level 5.

In this case, the snowball sample has a clear majority, with 60% having selected level 3 for meat-like smell of plant-based meat alternatives. While, the meat-like smell for the Prolific group had a varied distribution.

The omnivore group has varying attitudes towards meat-like taste, meat-like look, meat-like texture and meat-like smell. However, most of them did not want plant-based meat alternatives to bleed. From the interviews, a few omnivores are disappointed with the sensory experience of plant-based analogues, while one is influenced to consume them because other household members like it and one thinks that plant-based meat alternatives are very processed. The omnivores have differing attitudes towards sensory experiences for plant-based meat alternatives similar to the varying opinions of the flexitarian group. From prior literature, omnivores are another target group that plant-based companies encourage to make dietary transitions, however this group is not impressed by the sensory appeal akin to meat that is offered by plant-based meat alternative companies.

5.3.5 Heavy Meat Eater

For this category, there were no respondents from the snowball sample. The following graphs represent the Prolific sample:

Meat – like taste

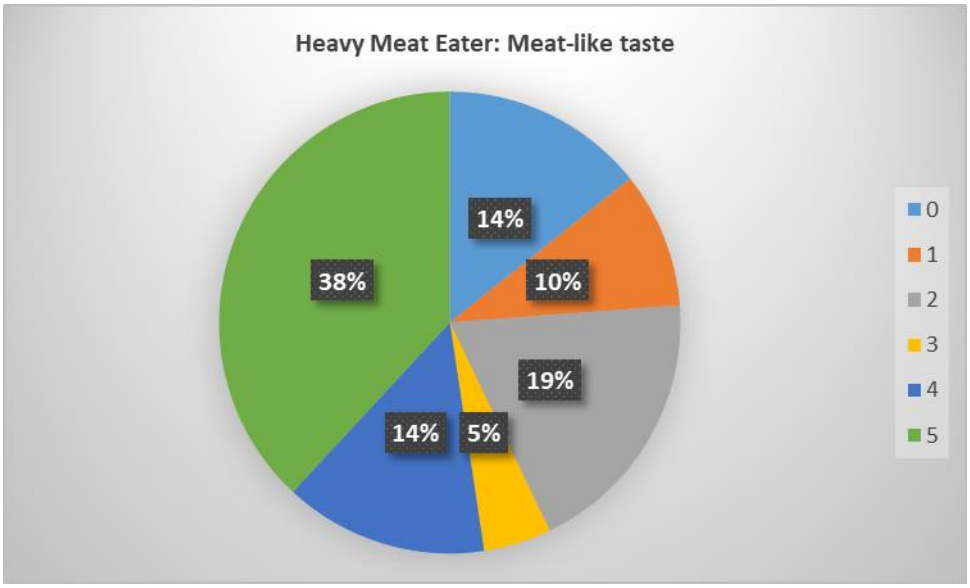

Figure 5.49 Heavy Meat Eater: Meat-like taste

From Figure 5.49, it is seen that 14% of the heavy meat eater group chose level 0 of importance for meat-like taste. While, 10% chose level 1, 19% chose level 2, 5% chose level 3, 14% chose level 4 and 38% chose level 5. Hence, a larger percentage gave most importance to plant-based meat alternatives.

Meat – like look

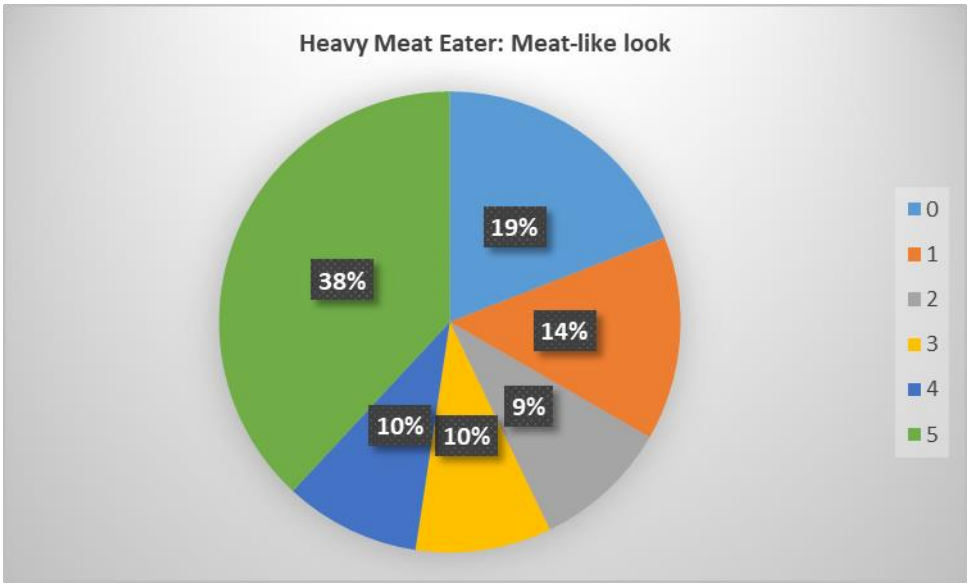

Figure 5.49 Heavy Meat Eater: Meat-like look

Prolific sample

From Figure 5.49, it was observed that 19% gave an importance of 0 to meat-like look of plant-based meat alternatives. While 14% chose level 1, 9% chose level 2, 10% chose level 3 and 4 each. While 38% chose level 5. A higher percentage of meat eaters gave most importance to meat-like look of plant-based meat alternatives.

Meat-like texture

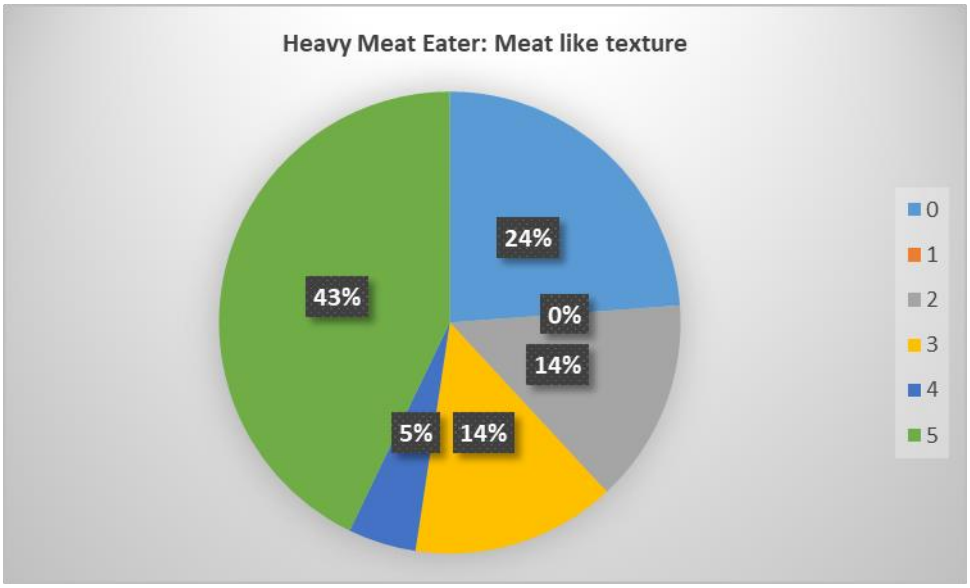

Figure 5.50 Heavy Meat Eater: Meat-like texture

From Figure 5.50, 24% chose an importance of level 0 for meat-like texture of plant-based meat alternatives. While 14% chose levels 2 and 3, while 5% chose level 4 and 43% chose level 5. A comparatively larger percentage of the meat eaters gave most importance to meat-like texture of plant-based meat alternatives.

Blood-like juiciness

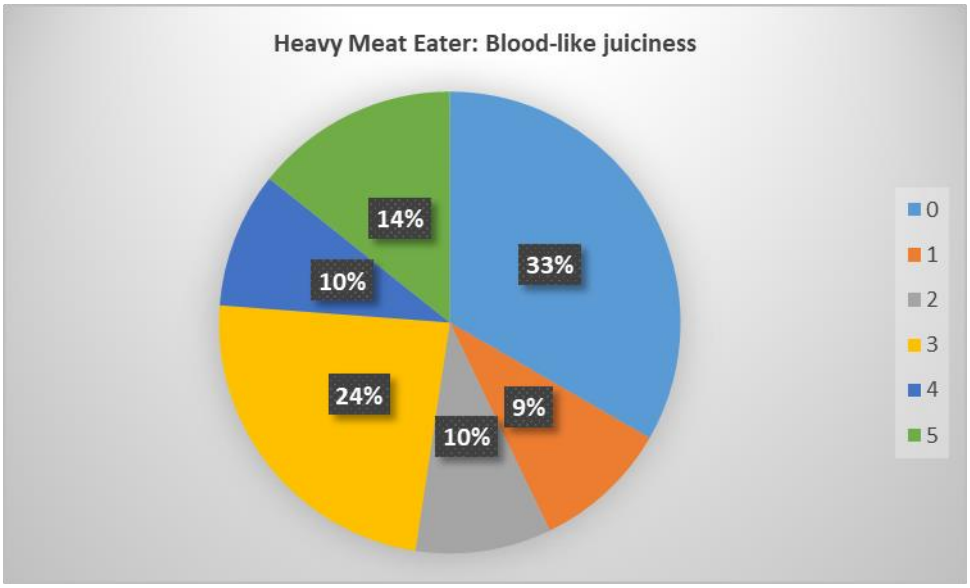

Figure 5.51 Heavy Meat Eater: Blood-like juiciness

From Figure 5.51, 33% chose level 0 of importance for bloodiness of plant-based meat alternatives. While, 9% chose level 1, 10% chose level 2, 24% chose level 3, 10% chose level 4 and 14% chose level 5. The heavy meat eater group has assigned varying levels of importance to blood-like juiciness of plant-based meat alternatives.

Meat-like smell

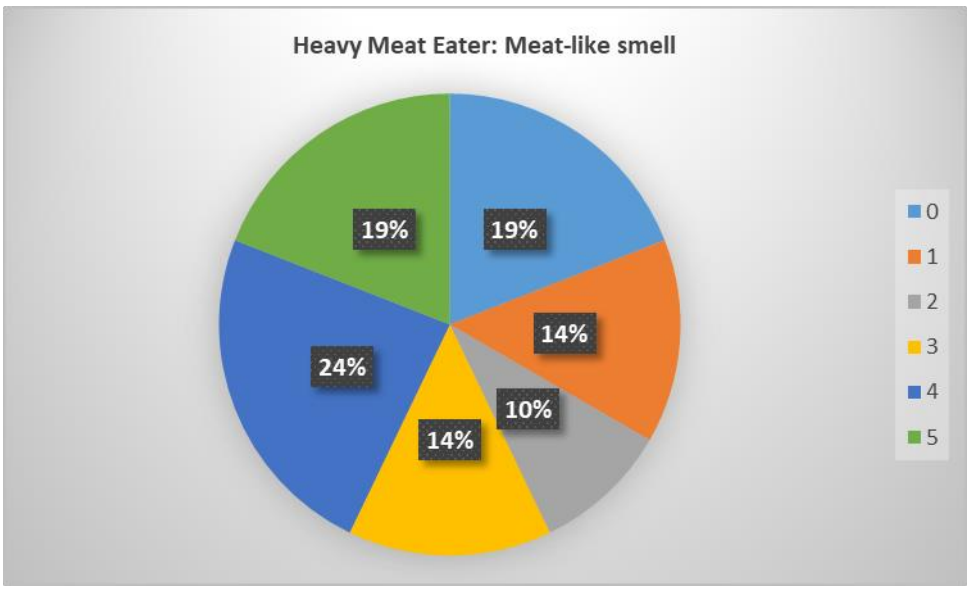

Figure 5.52 Heavy Meat Eater: Meat-like smell

From Figure 5.52, 19% of the heavy meat eater group selected levels 0 and 5 of importance for meat-like smell. While 14% chose levels 1 and 3, 10% chose level 2 and 24% chose level 4.

Naturally a majority or large percentage of heavy meat eater group naturally preferred plant-based meat alternatives to taste like meat, look like meat and have a meaty texture, while not as many wanted plant-based meat alternatives to bleed and they had varying opinions on its meat-like smell. As seen in an earlier section, heavy meat eater group chose plant-based meat alternatives as a healthy replacement to meat. The strategy of plant-based meat companies regarding mimicking the sensory appeal of meat is relevant and important to heavy meat eaters, rather than omnivores and flexitarians.

5.3.6 Ultra processed diet

For this category, there were no respondents from the snowball sample. The following graphs represent the Prolific sample:

Meat – like taste

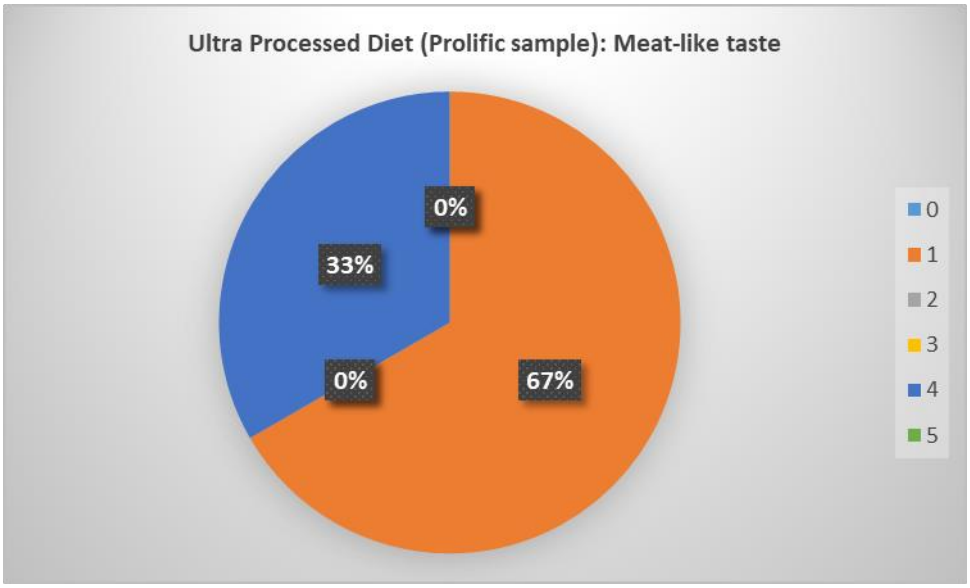

Figure 5.53 Ultra processed diet group: Meat-like taste

From Figure 5.53, it is seen that 67% of respondents chose level 1 for importance of meat-like taste of plant-based meat alternatives, while 33% chose level 4. A majority percentage gave no importance to meat-like taste of plant-based meat alternatives. There were no responses for levels 0, 2, 3 and 5.

Meat – like look

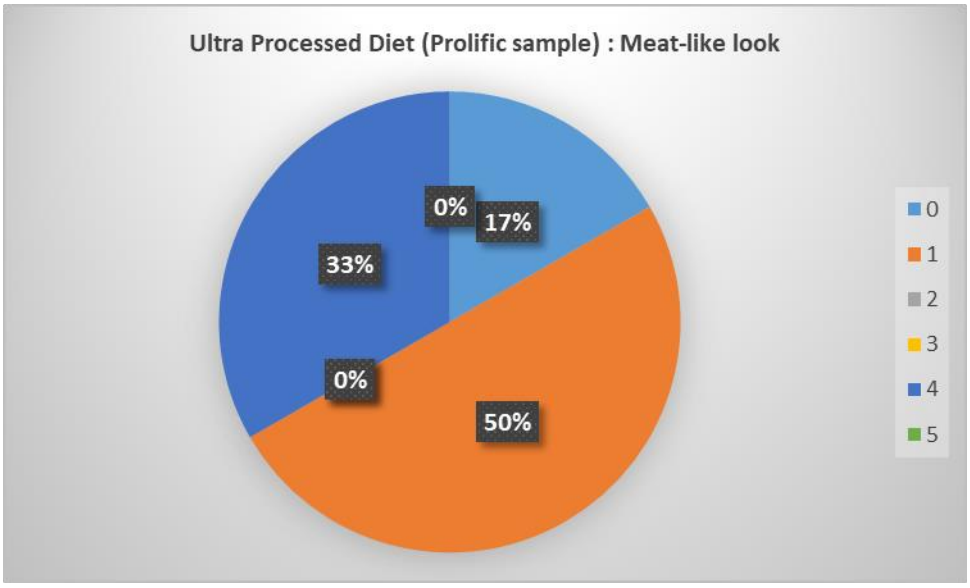

Figure 5.54 Ultra processed diet group: Meat-like look

From Figure 5.54, it is seen that the 17% of the respondents chose level 0, 50% chose level 1 and 33% chose level 3 of importance for meat-like look for plant-based meat alternatives. It is noted that half the group chose level 1, which is low level of importance to meat-like look for respondents with an ultra-processed diet. There was no response for levels 2, 3 and 5.

Meat-like texture

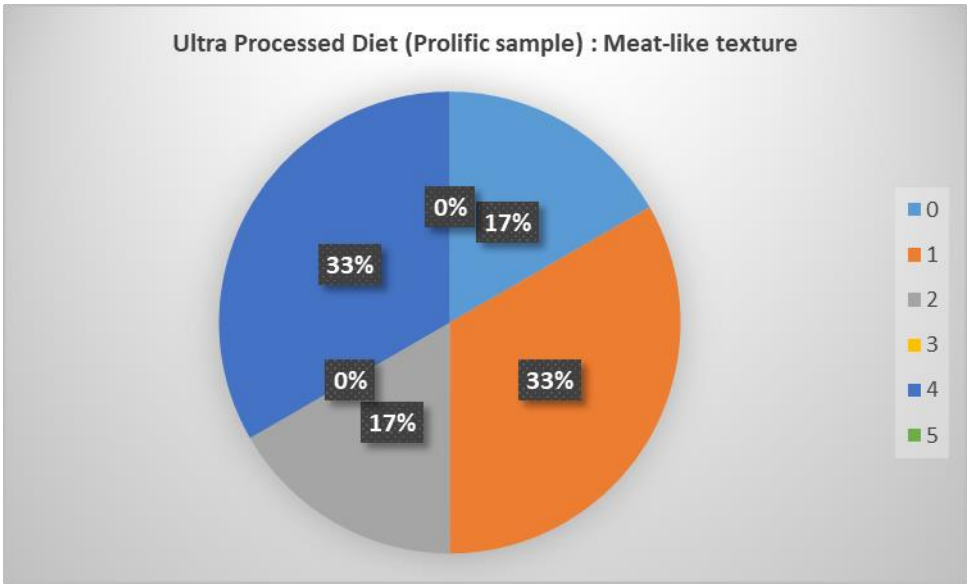

Figure 5.54 Ultra processed diet group: Meat-like texture

From Figure 5.54, 33% of the respondents chose levels 1 and 4 each, while 17% of the respondents chose levels 0 and 2.

Blood-like juiciness

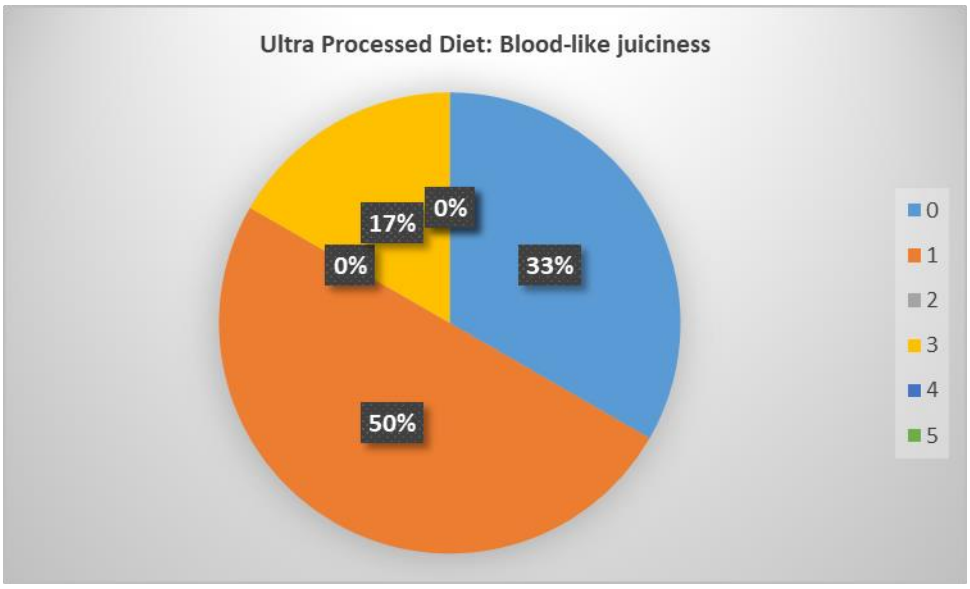

Figure 5.54 Ultra processed diet group: Blood-like juiciness

From Figure 5.54, 33% selected level 0, 50% selected level 1 and 17% selected level 3 of importance for blood-like juiciness. While there were no responses for levels 2, 4 and 5. The ultra-processed diet group was leaning towards the lower importance spectrum of blood-like juiciness of plant-based meat alternatives.

Meat-like smell

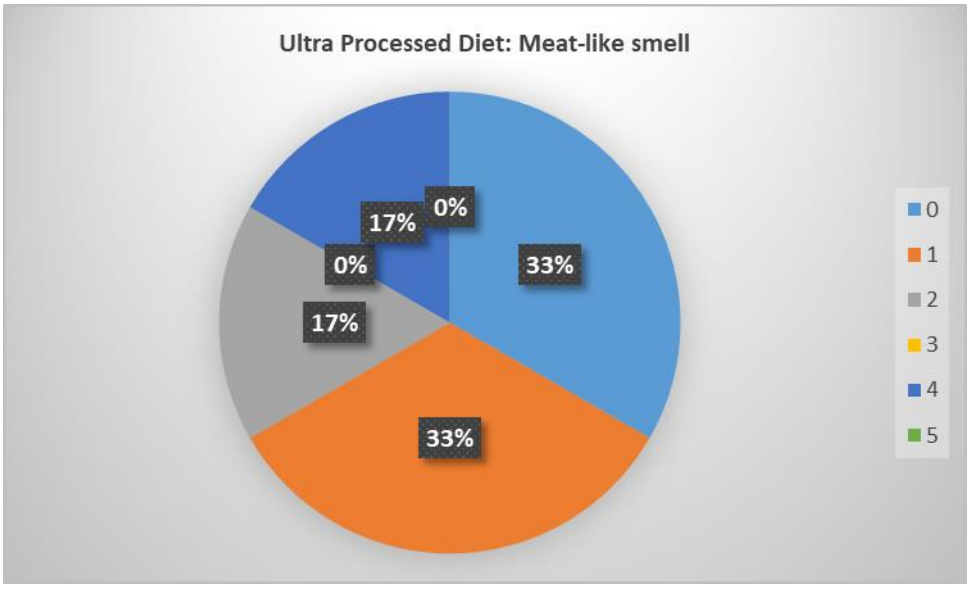

Figure 5.55 Ultra-processed diet (Prolific sample): Meat-like smell

From Figure 5.55, 33% of the respondents selected levels 0 and 1, while 17% selected levels 2 and 4 of importance for meat-like smell. There were no respondents for levels 3 and 5.

The respondents from the ultra-processed diet had a majority that gave low importance to meat-like taste and meat-like look and blood – like juiciness. However, if it isn't similarity to

meat, it raises questions regarding why this group is interested in consuming plant-based meat alternatives.

There were no participants from the meat eater or ultra-processed diet for interviews.

5.4 Discussion

This section compares the results from the qualitative and quantitative data pertaining to the sensory experiences of different consumer groups regarding the affinity to meat of plant-based meat alternatives. It addresses RQ1 (How do different consumer groups perceive the sensory experiences and expectations of eating plant-based meat alternatives?) using the framework of alternative meatscapes.

As it has been seen, the interviews and surveys represent two samples of snowball and Prolific, while the different consumer groups considered are vegan, vegetarian, flexitarian, omnivore, heavy meat eater and lastly a group that has an ultra-processed diet.

From chapter 3, figure 1, from the diagram of alternative meatscape framework, it includes sensory experiences and resemblance to meat of plant-based meat alternatives, brands of plant-based meat alternatives that consumers have tried and are familiar with, how consumer groups cook or use plant-based meat alternatives and its popularity among other household members.

As observed from the interview excerpts, the brands that have been mentioned are Quorn, Linda McCartney Foods, Beyond Meat and Moving Mountains. Different consumer groups have varying fondness and dislike towards the five aspects comparing the similarity of plant-based meat alternatives to the characteristics of meat products. Respondents mention that the qualities of plant-based meat alternatives vary according to brand as well as the product range.

Drawing from literature review, two of the leading brands of plant-based meat alternatives, Beyond Meat and Impossible Burger, known for their resemblance to meat target omnivores (Apostolidis and McLeay 2016) and for meat eaters and flexitarians (Hoek et al. 2011) however as per the data from this study, only 8% of the omnivores and 4% each of flexitarians and heavy meat eaters chose plant-based meat alternatives for its resemblance to meat. Moreover, unlike the opinions of the authors, a sizeable percentage of vegans and vegetarians also prefer plant-based meat alternatives for the sensory experience similar to meat. It could be because these respondents have not been vegan or vegetarian since childhood and look for familiarity and comfort or even fulfilling meat cravings through plant-based meat alternatives.

In tandem with Apostolidis and McLeay (2016), further product development by focusing on different consumer groups rather than average customers. Unlike the recommendations of Hoek et al. (2011), plant-based meat alternatives should not be made to resemble all sensory experiences of meat. From this study, the data from interviews and surveys reveal that different consumer groups have varying expectations from plant-based meat alternatives. The different consumer groups of vegan, vegetarian, flexitarian, omnivore, heavy meat eater and ultra-processed diet have varying opinions regarding meat-like taste, meat-like look, meat-like texture and meat-like smell. However, a majority or close to majority of consumers did not want plant-based meat alternatives to bleed, the vegans and vegetarians and flexitarians had larger percentages, but even omnivores and heavy meat eaters had sizeable groups that did not plant-based meat alternatives to bleed.

It was interesting to note how, one of the vegans thought that heavy meat eaters found the moving mountain burger tastier than a meat burger. However, the data from the surveys and interviews did not suggest the same. While, a vegan and vegetarian respondent thought that the burger patty was very close to meat and were unable to finish their burger. Further, from the interviews, a flexitarian, vegan have reduced or quit eating meat due to the influence of their partners, while an omnivore tries more plant-based meat alternatives due to his partner and even due to other family members. Moreover, one of the respondents mentioned that she was familiar with Linda McCartney Foods advertisements and signage and felt comfortable purchasing their products.

Through the alternative meatscape lens, it is evident that not only do different consumer groups have varying opinions towards plant-based meat alternatives and their affinity to meat. The similarities to meat are most important to heavy meat eaters, while they are of varying importance for omnivores and flexitarians and of lower importance to vegans and vegetarians. In order to enable consumers to maintain plant-based diets through meat alternatives and to attract the meat-eater group, plant-based meat brands should focus on the requirements of different consumer groups to create a product range that addresses specific needs rather than focusing on an average consumer, or only a particular group such as flexitarian, omnivore or heavy meat eater group.

The next chapter studies whether consumers with different dietary preferences consider plant-based meat alternatives as a replacement for meat or a new and separate product.

6. Plant-based meat alternatives and their relationship with demand for meat

Plant-based meat alternatives may have a role to play in the reduction of global demand for meat. There is great enthusiasm around plant-based meat alternatives and other analogues, however they are distant from creating a shift towards plant-based dietary pattern (Hu 2019). Consumers may consider plant-based meat alternatives as a replacement for meat or as another product category. However, plant-based meat alternatives do not form an essential part of diet and often serve as a product that makes eating more interesting. Sometimes seen as a treat or luxury item and other times as a food that appears on the menu every week (Interview notes).

6.1 Overview of the chapter

This chapter examines responses from surveys from both Prolific and snowball samples to understand the impact of plant-based meat alternatives on demand for meat pertaining to different consumer groups. It also analyses first-hand interviews to understand whether plant-based analogues have been considered as meat alternatives or as a separate product category.

It addresses the second RQ (How do different consumer groups perceive plant-based meat substitutes and their relationship to meat?). In this chapter, I analyse how plant-based meat alternatives have impacted the demand for meat of different consumer groups, namely flexitarian, omnivore, heavy meat eaters and people with ultra-processed diets categories. It explores if the demand or consumption of meat for consumer groups has remained unchanged, has reduced or increased. The excerpts from interviews are used to support or contrast the results from the quantitative data.

6.2 Theoretical Framework

In this section, the alternate meatscape is used to further guide analysis of consumer attitudes towards plant-based meat analogues. It presents mental images and ideas of consumer groups on whether they consider plant-based alternatives as meat substitutes or one that is a new and separate category. It includes how individual consumers and consumer groups cook with

plant-based meat alternatives. It also examines the effect that plant-based meat alternatives have had on the relationship between different consumer groups and meat.

6.3 How have plant-based meat alternatives impacted the demand for meat pertaining to different consumer groups?

In this section, the survey results from both snowball as well as Prolific sample are separated as they depict differing trends. It provides an overview of the results in Figure 6.1 and Figure 6.2 that includes different consumer groups and variation in the demand for meat due to introduction of plant-based meat alternatives in their diets. Further, it provides a case by case analysis on impact of plant-based meat alternatives on demand for meat and thereby excluding vegan and vegetarian groups. It also includes the opinions of consumer groups and whether they consider plant-based meat alternatives as a meat-replacement or a separate product category.

6.3.1 Overall impact on demand for meat by plant-based meat alternatives

From Figure 6.1 and 6.2, the change in demand for meat by different consumer groups is visualized and they are explained as per different consumer groups below.

Snowball sample

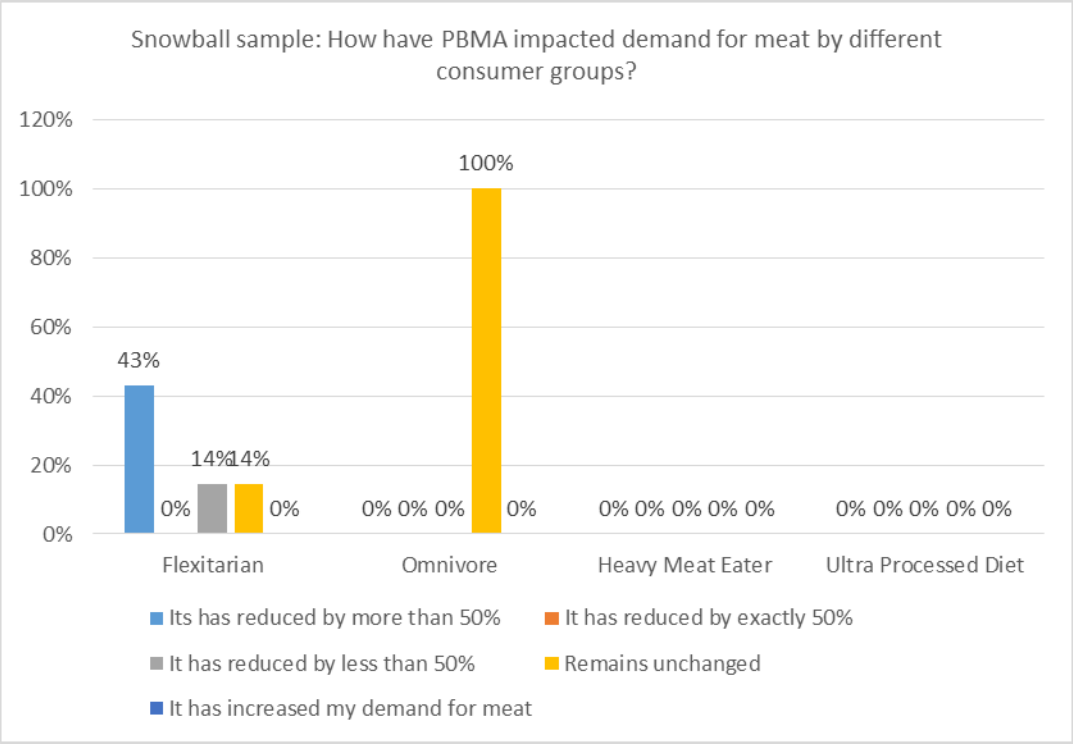

Figure 6.5 Snowball sample: impact on demand for meat created by plant-based meat alternatives for different consumer groups

From Figure 1, it is seen that there has been a 'more than 50% reduction in meat demand' by 43% for the flexitarians. It has reduced 'less than 50% of meat demand' for flexitarians by 14%. While it remains unchanged for 14% of flexitarian group and 100% of the omnivore group. (It should not be considered representative as the omnivore group has a small sample size of 4 respondents). There were no responses under reduction in demand for meat by 50% and increase in meat demand. Moreover, there were no responses from the groups of Heavy Meat Eater and Ultra-processed diet for the snowball sample.

Iterating from the literature review, the flexitarian group was identified as a consumer group that had not been well-represented in scientific research and included in policies and sustainable consumption (Davegos and Bakker 2012). From the snowball sample, the flexitarian group is the only group with reduction in demand for meat from the snowball sample. The demand for flexitarians for meat has reduced by 57% in varying capacities while for only 14% of the flexitarians the demand for meat remains unchanged. Since, flexitarians are a target group for plant-based meat alternative companies, they have been successful in reducing the demand for meat for more than majority of flexitarians.

Prolific sample

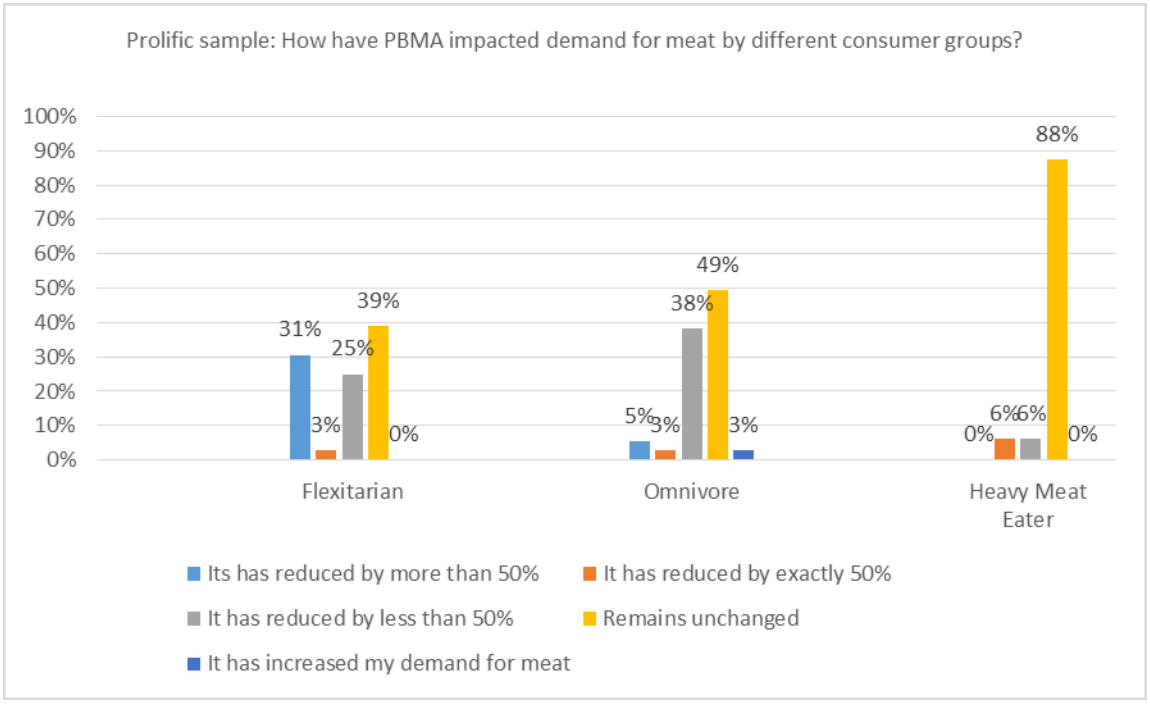

Figure 6.6 Prolific sample: impact on demand for meat created by plant-based meat alternatives for different consumer groups

From Figure 6.2, it is seen that 'demand for meat has reduced by more than 50%' for 31% of flexitarians and 5% of omnivores and 0% for heavy meat eaters. It has 'reduced by 50%' for

3% of flexitarians and omnivores each and 6% for heavy meat eaters. It has 'reduced by less than 50%' for 25% of flexitarians, 38% of omnivores and 6% of heavy meat eaters. While it remained unchanged for 39% of flexitarians, 49% of omnivores, and 88% of heavy meat eaters. The ultra-processed category did not have adequate representation and has been removed deliberately.

For the Prolific sample, the total reduction in demand for meat (in varying capacities) for flexitarians is 59%, 47% for omnivores, and 12% for heavy meat eaters. While demand for meat has remained unchanged for flexitarians is at 39%, for omnivores by 49% and 88% for heavy meat eaters. In other words, the flexitarian group has seen the most reduction in demand for meat, while omnivores have an almost equal percentage for reduction in demand for meat and demand remaining unchanged, while most naturally there was least reduction in demand for meat for heavy meat eaters.

Combined sample

The figure below presents a combined sample of snowball and Prolific depicting total percentage of change in demand for meat and consistent demand for meat.

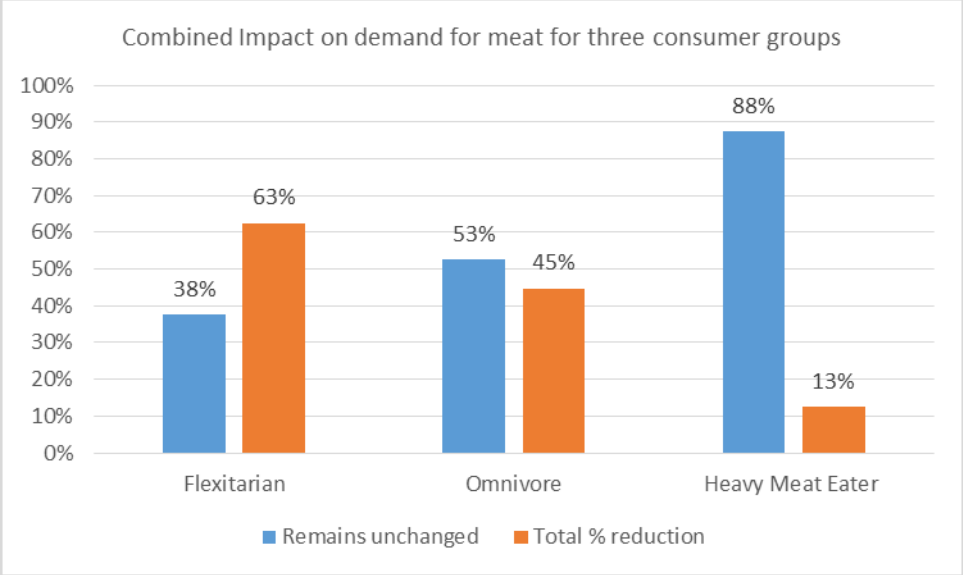

Figure 6.3 Impact on demand for meat for three consumer groups

From Figure 6.3, it is observed that a reduction in demand for meat due to plant-based meat alternatives for flexitarians at 63%, omnivores at 45% while heavy meat eaters at 13%. While, it remained unchanged for heavy meat eaters at 88%, omnivores at 53% and flexitarians at 38%. For reduction in demand for meat, the groups in descending order are flexitarians,

omnivores and heavy meat eaters, while the same sequence follows an ascending order for demand for meat remaining consistent.

The flexitarian group in the Prolific sample observes a higher reduction in demand for meat in comparison to demand remaining unchanged. The plant-based companies have been successful in reducing the demand for meat for flexitarians, omnivores and heavy meat eaters. Although the expectations and requirements of consumer groups of omnivores and heavy meat eaters need more attention from plant-based meat alternative companies.

6.3.2 Impact on demand for meat due to plant-based meat alternatives as per dietary group

In this section the two factors are observed as per consumer group, one, how do plant-based meat alternatives impact the demand for meat. Two, whether different consumer groups consider plant-based meat alternatives as meat substitutes or a different category.

Vegans

This group does not consume meat and the impact on demand for meat cannot be analysed. However, their perspective regarding the categorization of plant-based meat alternatives from the snowball sample is presented below.

Plant-based meat alternatives as meat substitutes.

One of the vegan respondents R2, uses plant-based meat alternatives as protein alternatives approximately five days a week. She generally adds fake chicken pieces to a curry or uses plant-based soya mince for chilli. Although, she would rather have raw ingredients and would be less inclined to buy something that is designed to look like piece of meat or is too processed. However she says "I would make food that are similar to meat dishes, but just with plant based products instead" (Interview notes). In other words, although the processed nature of plant-based meat alternatives concerns her, she uses them as she thinks it is convenient as well as a good source of protein for a vegan (Another implicit trade-off which will be discussed further in chapter 7).

Similarly, R1, another vegan, cooks plant-based meat alternatives on the side and then adds them to the main dish, as often they are already seasoned or almost ready to eat. Unlike meat they don't have to be cooked for long hours. She also claims that, "I would associate it as being a substitute rather than a new food product. And I'm not sure whether many other vegans would think the same. I started eating meat first and then I became plant based. So I think that's where the association comes from,

because now I'm not having meat. So now this is the substitute for my meat. Maybe vegans who grew up vegan would just think- Oh, yeah, that's a product on its own" (Interview notes).

R4 another vegan often makes bolognese with soya mince or a burger, fish and chips using plant-based meat products especially for tea time. "I think as a substitute for meat" (interview notes), he also says that the composition is designed to appease people who eat meat.
R6, also a vegan thinks of it as a substitute for meat. As a lot of food that's very simple or comfort food is quite traditionally meaty and people look for something that's a replacement and is yet meaty. Moreover, she felt it was difficult to answer as it had been a long time since she ate meat. Recently, if she feels that a product tastes very close to meat, a meat eater would not agree with her.

R7, another vegan would use plant-based meat alternatives for breakfast, a chicken curry, in a cheese burger or vegan bacon to treat herself. She too considers them to be a replacement to meat.

Five vegan respondents from the snowball sample considered plant-base meat alternatives to serve as a replacement for meat. While there were no vegans who considered these products to form a separate category. The five respondents have not been vegan their whole life and they turn to plant-based meat alternatives when they want something that is interesting or has nostalgic resemblance to meat. There is a dichotomy in the vegan group, one section that would crave the meat-like feeling of meat, while another that might be disgusted if the plant-based meat alternative is too meaty. However, in this case, the five respondents fall in the former category.

Vegetarians

This group too does not consume meat and the impact on demand for meat cannot be analysed. However, their perspective regarding the categorization of plant-based meat alternatives from the snowball sample is presented below.

Plant-based meat alternatives as meat substitutes

R9, a vegetarian thinks that plant-based meat alternatives are a substitute for meat. She has not come across a vegetarian who likes these products. She's seen people who are transitioning from meat eating to vegetarianism or veganism who like it and it serves as a crutch that helps with the transition.

Plant-based meat alternatives as a separate category

R5, a vegetarian makes English breakfast with her family and uses Quorn products: sausages, burgers, fillets and often uses mince for shepherd's pie. Although, "I think of it as a product in itself" (interview notes). She doesn't eat meat and wouldn't look at it as an alternative, but another product in the market to try. Similarly, R10, another vegetarian believes that she would consider plant-based meat alternatives as meat replacements if she ate meat.

The vegetarian group from the snowball sample is split, with one respondent who considers them as meat replacements while two others think of them as a separate category.

Flexitarians

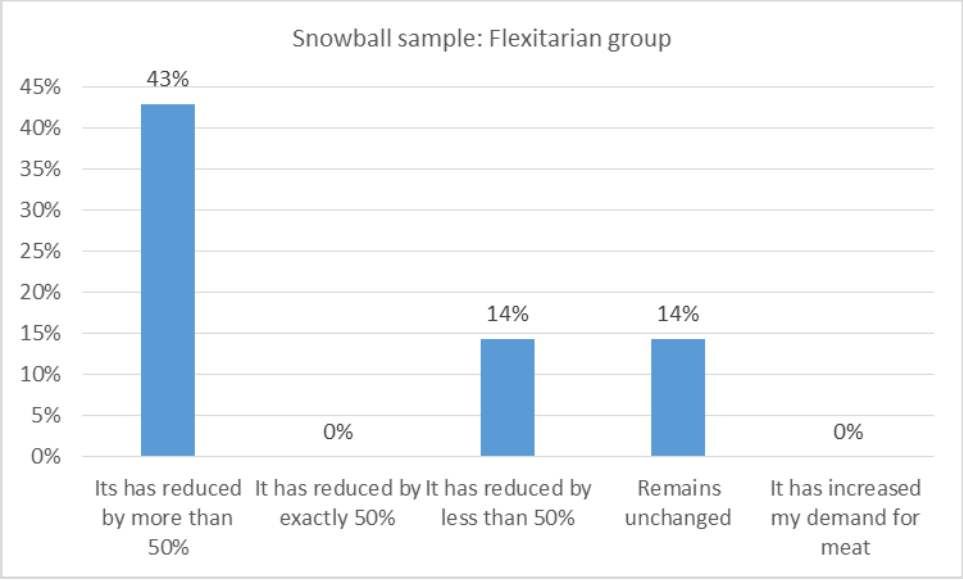

Figure 6.4 Snowball Sample: Impact on demand for meat for flexitarian consumer group

From Figure 6.4, it is seen that the demand for meat for flexitarians from snowball sample has reduced by 57% (in varying capacities) and remains unchanged for 14%.

Plant-based meat alternatives as a separate category: Flexitarian

From the snowball sample, the following excerpts were observed.

R11, a flexitarian thinks that plant-based meat alternatives are a new product in the way he uses them. He thinks it's a creative thing where he chooses to use them as a filling. For example: tofu, not a novel meat analogue, has been used as a meat substitute although culinary traditions have been evolving. He has not been satisfied by their imitation of meat and is disappointed when he has tried to cook plant-based meat alternatives in recipes that are

traditionally meat based. Moreover, R12, another flexitarian said that it could substitute meat if one is a meat eater or if you're choosing to reduce your meat consumption and would be happy to use plant-based meat products. Although, "I think it's a category in itself and don't associate it with meat. I was never a big meat eater and would find it difficult to say if it works as a good substitute from other's perspectives" (interview notes).

From the interviews, neither of the flexitarians viewed plant-based meat alternatives as a replacement for meat.

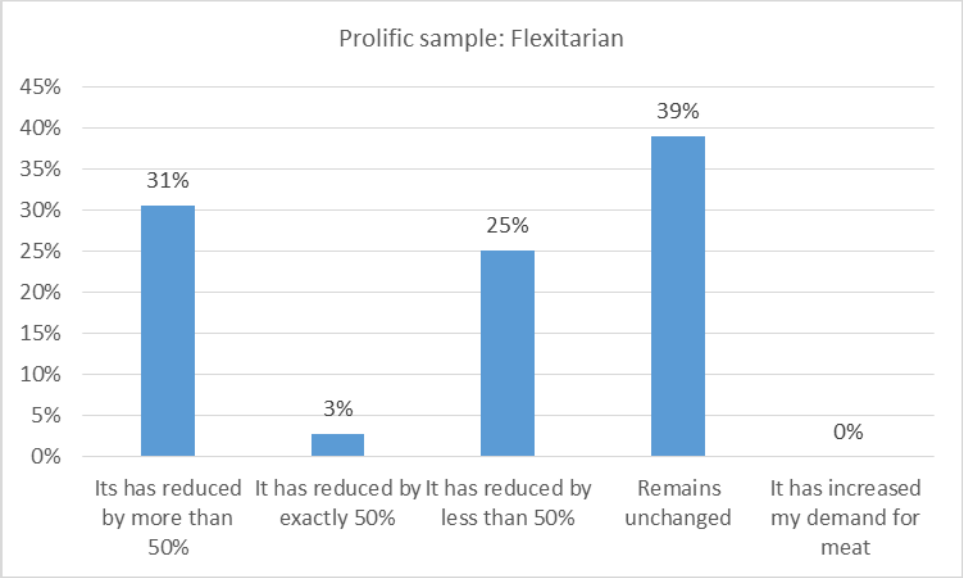

Figure 6.5 Prolific Sample: Impact on demand for meat for flexitarian consumer group

From Figure 6.5, the demand for meat for flexitarian group from Prolific sample has reduced for 59% (in varying capacities) and remains unchanged for 39%.

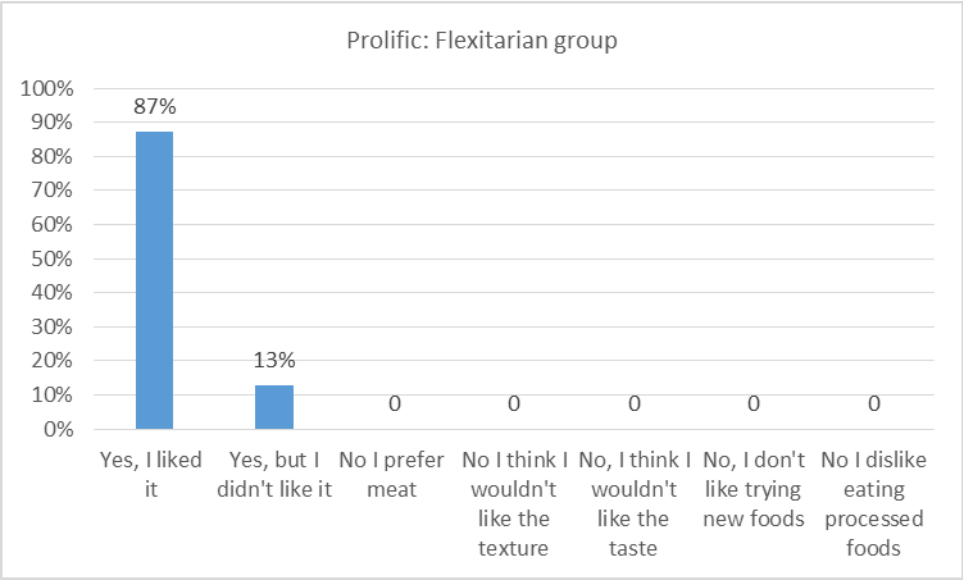

Figure 6.6 Flexitarian: Prolific survey, reasons why respondents like or dislike PBMAs

From Figure 6.6, it is seen that 100% of the flexitarian group has tried plant-based meat alternatives, 87% of the flexitarians liked plant-based meat alternatives while 13% mentioned that they had tried it and disliked it.

While other flexitarians from the survey mentioned that, "it's lighter on digestion and better for the environment but sometimes the meat option tastes better and is cheaper" (Survey results), a trade-off that is discussed further in chapter 7. While another mentioned that he ate vegan food due to his partner who was vegan. Another respondent mentioned that she felt like it is more environmentally, animal friendly and healthier, while it tastes just as nice.

Others had mixed opinions, they like some products and did not like others. While three respondents tried it and didn't like plant-based meat alternatives. They mentioned that "I have only tried Quorn, but I found it had an unusual taste that I did not enjoy". Or another says I don't like the texture of Quorn or tofu. While another is satisfied with vegetables 90% of the time and occasionally eats meat when invited for a dinner perhaps. But she does not eat meat or imitation meat often. While, only one respondent was concerned about the amount of ingredients in these alternatives (Survey responses).

Comparing the quantitative data and qualitative excerpts from the snowball sample, the data from Figure 6.4 and Figure 6.5 follow similar trends, 57% of the respondents from the snowball sample and 59% of respondents from Prolific sample claim that plant-based meat alternatives have reduced their meat consumption. While from Figure 6.6, 87% of the Prolific respondents liked the plant-based meat alternatives that they tried. However, the two

respondents from the interviews (snowball sample) are either not satisfied with the product or were not very fond of meat and consider plant-based meat alternatives as a separate product category. While there was no significant pattern found in the qualitative responses from the surveys. Since, flexitarians are a target group, while 100% of the respondents have tried it and a majority even liked them. However, from the interviews there was conflicting perspectives from plant-based meat companies as the respondents from the interviews do not consider them to be replacements for meat. It offers more evidence for companies to alter their strategy or approach.

Omnivores

Snowball sample

The sample size of 4 respondents is too small to be represented.

Prolific sample

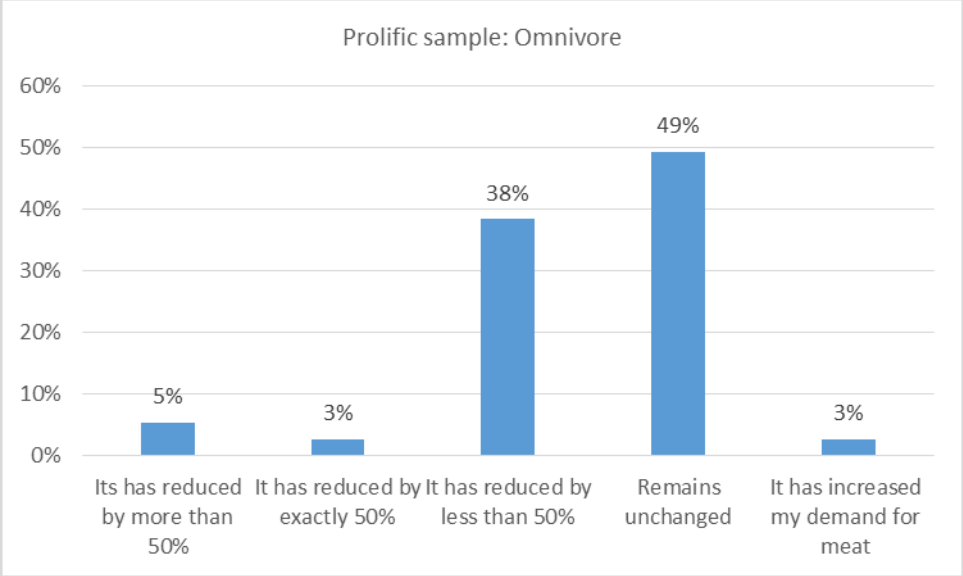

Figure 7.7 Prolific sample: Impact on demand for meat for omnivore consumer group

From the Figure 6.7, 5% mentioned that their 'demand for meat has reduced by less than 50%'. A very small percentage or 3% selected that their 'demand for meat was reduced by 50%'. While 38% mentioned that it had 'reduced by less than 50%'. Hence, 46% of the omnivores experienced a reduction in demand for meat due to plant-based meat analogues. While 49% of omnivores claimed that their meat demand remained unchanged. Moreover, a small but surprising percentage, 3% mentioned that plant-based meat alternative's increased their demand for meat.

Studying other responses from the 3% in the survey, it was realized that the 3% consisted of 2 respondents, one of whom had tried the product and disliked it and really enjoys eating meat. While the other respondent, found the product to be too bland. Since the number of respondents are only 2, it would be too small a sample to make inferences.

Plant-based meat alternatives as meat replacements

R8, an omnivore likes Quorn and recently had a vegetarian friend over and they decided to make chilly cheese nachos and used Quorn mince instead of regular mince. She uses them as direct replacements and most of the products that she purchases are ready to cook in the oven. They could be simple items such as burger or pies but most often she uses Quorn pieces and mince from the plant-based meat alternative section. Although she mentions that it isn't a priority and would buy it if she saw something that she finds interesting.

Plant-based meat alternatives as a new product category

R3, an omnivore has tried to make a Ragu, a typical Italian dish like bolognese, but instead of using meat or minced meat used Quorn products. However, he considers plant-based meat alternatives as an entirely different product.

Prolific survey

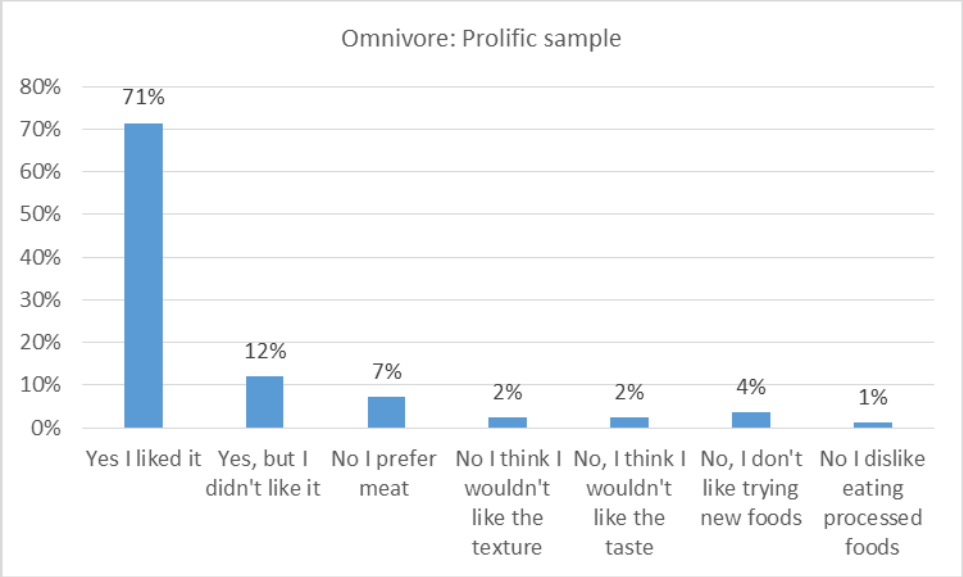

Figure 6.8 Omnivore: Prolific survey, reasons why respondents like or dislike PBMAs

From figure 6.8, it is seen that 83% have tried plant-based meat alternatives, while 17% have not tried it. Out of 83%, 71% of the omnivores liked the products, whereas 12% either have disliked it. From the Prolific survey sample, one omnivore commented that she prefers meat as she comes from a farming family and believes in meat produced with high food standards, while one said it tasted better and another said he had grown up eating meat and the taste had been ingrained in him. Yet another omnivore mentioned that she didn't like trying new foods and another preferred original meat. Moreover, another mentioned that she didn't like processed foods and thought that it was unhealthy.

From 6.7 he quantitative data presents that 46% of the omnivores faced a reduction in demand for meat due to the introduction of plant-based meat alternatives. While 49% the demand remained unchanged. The qualitative responses receives supports this claim as the two omnivore respondents have contrasting views about the meat replacement and a different

product category. Since the omnivore category is not homogeneous, participants might have similarly think that plant-based meat alternatives are processed or unhealthy, might not be comfortable with trying new foods, might find them too expensive or unwilling to change long-term habits.

Heavy meat eater

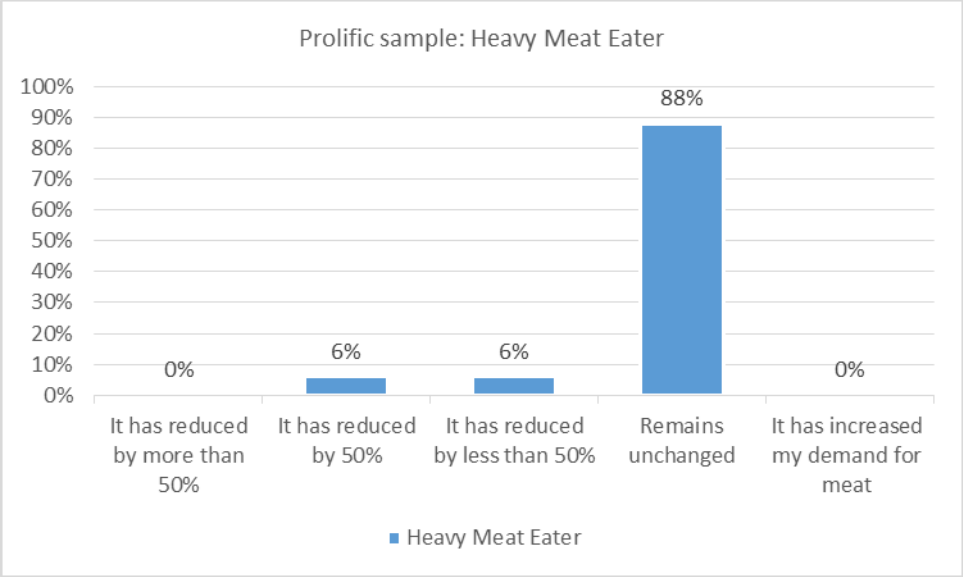

Figure 6.9 Impact on demand for meat for heavy meat eater consumer group

From the above figure 6.9, 6% claim that their 'demand for meat has been reduced by 50%' and another 6% claim that 'demand for meat has reduced less than 50%' respectively. Hence, 12% experienced a reduction in demand for meat. Whereas 88% mentioned that their demand for meat has remained unchanged. In other words, plant-based meat alternatives have not been very successful with reduction in demand for the heavy-meat eater group.

Prolific survey

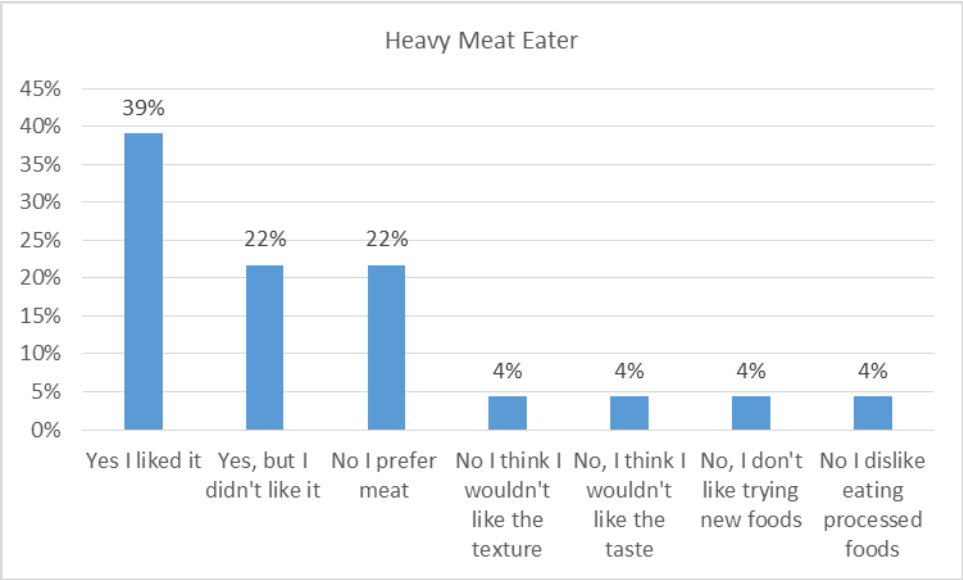

Figure 6.10 Heavy Meat Eater: Prolific sample, reasons why heavy meat eaters like or dislike PBMAs

From Figure 6.10, 61% of meat eaters have tried plant-based meat alternatives, out of which 39% of the Heavy Meat Eater group liked plant-based meat alternatives, while 22% didn't like the product. Even though 39% of the heavy meat eaters from the Prolific sample liked plant-based meat alternatives, only 12% mentioned a reduction in their demand for meat. Also implying that at least 27% of the heavy meat eaters were not satisfied with plant-based meat alternatives and did not consider them as meat replacements. While the views of the majority and remaining 61% either preferred meat, did not like the texture or taste or they did not like trying new foods and might consider processed foods to be unhealthy.

From the Prolific sample, one meat eater commented that he thought he would not like the texture, his partner ate Quorn products and he thought it was disgusting. While another heavy meat eater commented that "I am not willing to try something which has been artificially produced to imitate another product" (Survey results).

Since more than majority of heavy meat eaters have been unwilling to try plant-based meat alternatives or have disliked it, the product requires improvement on many fronts from texture and removal of 'disgust factor' from the minds of consumers. The heavy meat eater group is a target group for plant-based meat alternatives, this group thinks it is important for plant-based meat alternatives to resemble meat, moreover, sustainability by stealth might be useful for the case of heavy meat eaters.

Unfortunately, there were no respondents from the interviews who identified as heavy meat eaters. From Figure 6.9, it is seen that for a majority of heavy meat eaters their demand for meat has remained unchanged, it is likely that they do not consider plant-based meat alternatives as meat substitutes.

Ultra-processed diet

The graph below presents the impact of plant-based meat alternatives on the demand for meat for those with an ultra-processed diet.

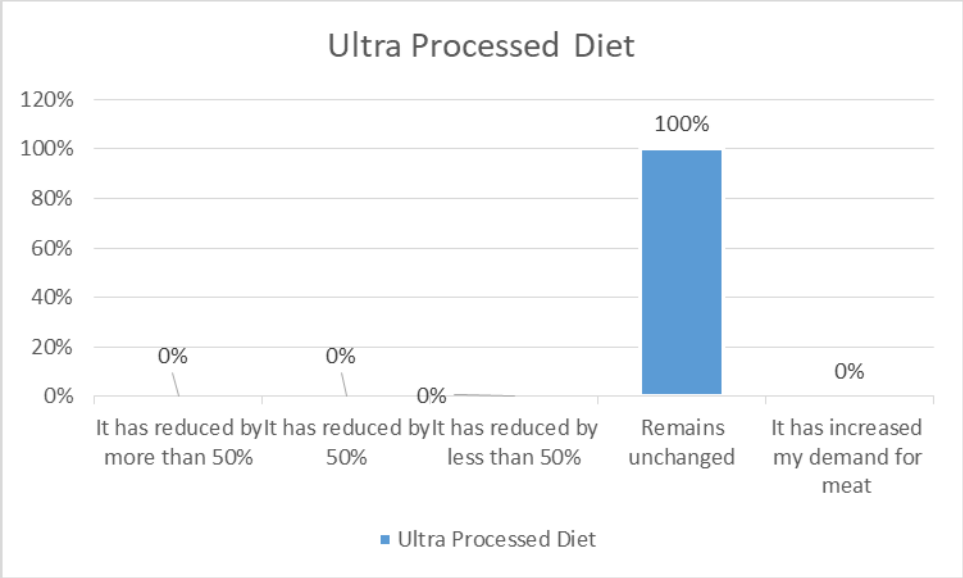

Figure 6.11 Impact on demand for meat for consumer group with ultra-processed diet

All respondents in the ultra-processed diet category selected remains unchanged for their demand towards meat consumption. However, the number of respondents within this category corresponded to 4 and it is too small make any inferences. Moreover, there were no respondents from the interviews who had a diet consisting of ultra-processed foods. However, from the Prolific survey sample, one respondent mentioned that she has tried plant-based meat alternatives and does not enjoy them and prefers meat (Survey responses).

This study acknowledges that that the snowball sample does not have adequate participation from all consumer groups and does not constitute a representative sample.

6.4 Discussion

This section connects the results from the qualitative and quantitative data analysis and addresses RQ2. The results are not representative in nature and the qualitative excerpts are by volunteers from the snowball sample, while the quantitative data is a combination of snowball as well as Prolific sample.

From Figure 3.1 in chapter 3, from the alternative meatscape, this chapter covers impact on demand for meat, reasons behind choosing/not choosing plant-based meat alternatives and how plant-based meat alternatives are used by consumers.

It has been observed that vegans and vegetarians, although do not consume meat, but if they used to eat meat previously, plant-based meat alternatives make their meals more interesting and offer familiarity and also perhaps satiates meat cravings, while many vegans did see it as a meat substitute, while the vegetarians had opposing views. While flexitarians that have been the primary target group for plant-based meat companies[6] have seen a definite decrease in demand for meat with the introduction these products. While, the omnivore group has observed some reduction in demand, it has not been able to receive a reduction from the majority of the omnivore group. While the heavy meat eater saw a reduction in demand for meat by a mere 12%, while 88% considered their demand for meat to remain the same. Whereas 38% are unwilling to try plant-based meat alternatives. While there was not enough evidence from people with an ultra-processed diet.

Considering the different perceptions and ideas about plant-based meat alternatives, companies should make products that suit the requirements for each consumer group. For example, a vegetarian raised concerns about the ultra-processed nature of the products. While for an omnivore as well as flexitarian, the plant-based meat alternatives did not match up to real meat. In order to make more people convert to plant-based diets, the meat analogue industry might have to consider a multiple product line suited for different consumer categories, some that resemble meat and others that don't mimic meat. Perhaps, improve the sensory appeal through product innovation of plant-based meat alternative to match up to the meat standards preferred by omnivores and heavy meat eaters.

[6] considering the top 4 from the survey, Quorn, Linda McCartney Foods, Impossible Foods and Beyond Meat

The perception of consumers regarding if plant-based meat alternatives are replacement for meat or separate category depends on multiple factors. For vegans and vegetarians, they might consider it to be meat alternatives if they have been meat eaters previously and have recently converted. While, for an individual who has been vegan or vegetarian their entire life, they would consider it as a new and separate category. While flexitarians could have differing opinions based on whether the product satisfies their sensory experiences, if they prefer the resemblance to meat, or prefer to eat meat or not. Whereas plant-based meat alternative companies need to gain further acceptance from heavy meat eaters, either through

6.5 Conclusion

The aim of this chapter was to examine if plant-based meat alternatives through the lens of alternate meatscapes and if they have been able to impact demand for meat for different consumer groups. Further, if these different groups consider them as meat replacements or a new product category.

From the qualitative interviews, not all consumer groups have uniform opinions regarding plant-based substitutes, the opinions of vegetarians, omnivores were split. Whereas, vegans and flexitarians agreed within their group; the vegan groups considers the products as meat alternatives and the flexitarians as a new product category. Moreover, from the quantitative data, the flexitarians especially and omnivores had a substantial reduction in demand for meat, while naturally for heavy meat eaters their demand for meat remained largely unchanged.

In conclusion, not all consumer groups had uniform opinions about meat analogues. Since these products have been with a purpose to help people transition to a largely plant-based diet, the results for the flexitarian group have been optimistic. However, to satiate other groups such as omnivores and heavy meat eater, perhaps further product innovation is required. While to keep vegetarians and vegans interested or those interested in health, another other products require development appeal to those who dislike the resemblance of plant-based meat alternatives to meat.

7. Priorities and trade-offs

"The three foundational motivations for food choice are taste, cost and convenience. Essentially a food choice or product must first meet perceived needs of tastiness, affordability, and ease of purchase and preparation for the majority of the consumers to consider it. Familiarity is an important purchasing driver for novel food products, such as plant-based meat" (Szejda et al. 2020, 6). While appeals to sustainability and animal welfare alone will be effective for only a small portion of the general population This chapter explores factors that affect food choice such as biological, economic and physical and social factors and explores the priorities and factors that are priorities and trade-offs made by consumers in the UK.

7.1. Overview of the chapter

This chapter addresses RQ 3 (How do different consumer groups prioritize factors and identify trade-offs while consuming plant-based meat alternatives?) The theoretical framework of the 'Alternate Meatscape' draws on ethical consumerism to juxtapose consumer perspectives regarding priorities and trade-offs. It brings together the theoretical framework pertaining to ethical consumerism and analyses relevant qualitative and quantitative data from surveys and interviews.

7.2 Theoretical framework

In this section, the theoretical framework of an 'Alternate Meatscape' is discussed pertaining to priorities and trade-offs of different consumer groups towards plant-based meat alternatives.

In a previous chapter, Alternate Meatscapes is defined as a concept pertaining to plant-based food products, specifically plant-based meat alternatives for this study. It is defined as real and imagined world for consumers pertaining to plant-based meat alternatives and encompasses interactions between these contexts. Within the ambit of food systems, the alternate meatscape includes ethical consumerism and an ethical consumer is a person who is concerned and consumes or purchases food products that are local, fair, ethical or organic and have a lower impact on environment, animals or people in the global south (Morgan 2010). These products are manufactured keeping with the ideologies of ecological integrity and social justice.

In the case of plant-based meat alternative, some academics such as Pimental and Goodland (2000) and Holker et al. (2019) argue that plant-based meat alternatives support ecological

integrity, animal rights and ethics. I agree that the concept of plant-based meat analogies is built on the foundation of animal rights and ethics, however its connection with ecological integrity is controversial. Raw ingredients such as soya or legumes used in the production of plant-based meat alternatives are farmed industrially using synthetic fertilisers and its highly processed nature makes it unlikely to be produced locally (Eshel et al. 2019). These contradictions on ethical consumerism and ecological integrity are important conundrums and the qualitative and quantitative data was used to highlight the differences in consumer perceptions.

7.3 Priorities and Trade-offs of different consumer groups

This section provides an overview of priorities of consumer groups towards plant-based meat alternatives. It includes an analysis of qualitative and quantitative data within the frameworks of ethical consumerism and ecological integrity. It also highlights the contradictions or trade-offs that consumers have made while choosing to consumer or not consume plant-based meat alternatives.

This section discusses priorities of different consumer groups based on both snowball sample and Prolific sample alongside graphical representation. Consumers were asked to rate multiple factors on a scale of 0 to 5, 0 being lowest and 5 being highest. The averages of the responses are presented below and any factor rated above 2.6 is considered a priority. The section below primarily discusses the top five priorities of consumer group. The qualitative responses to priorities and trade-offs from the interviews and survey are presented in support or in contrast to the quantitative data from the snowball and Prolific samples.

Vegan group

The vegan consumer group based on snowball and Prolific sample is presented below.

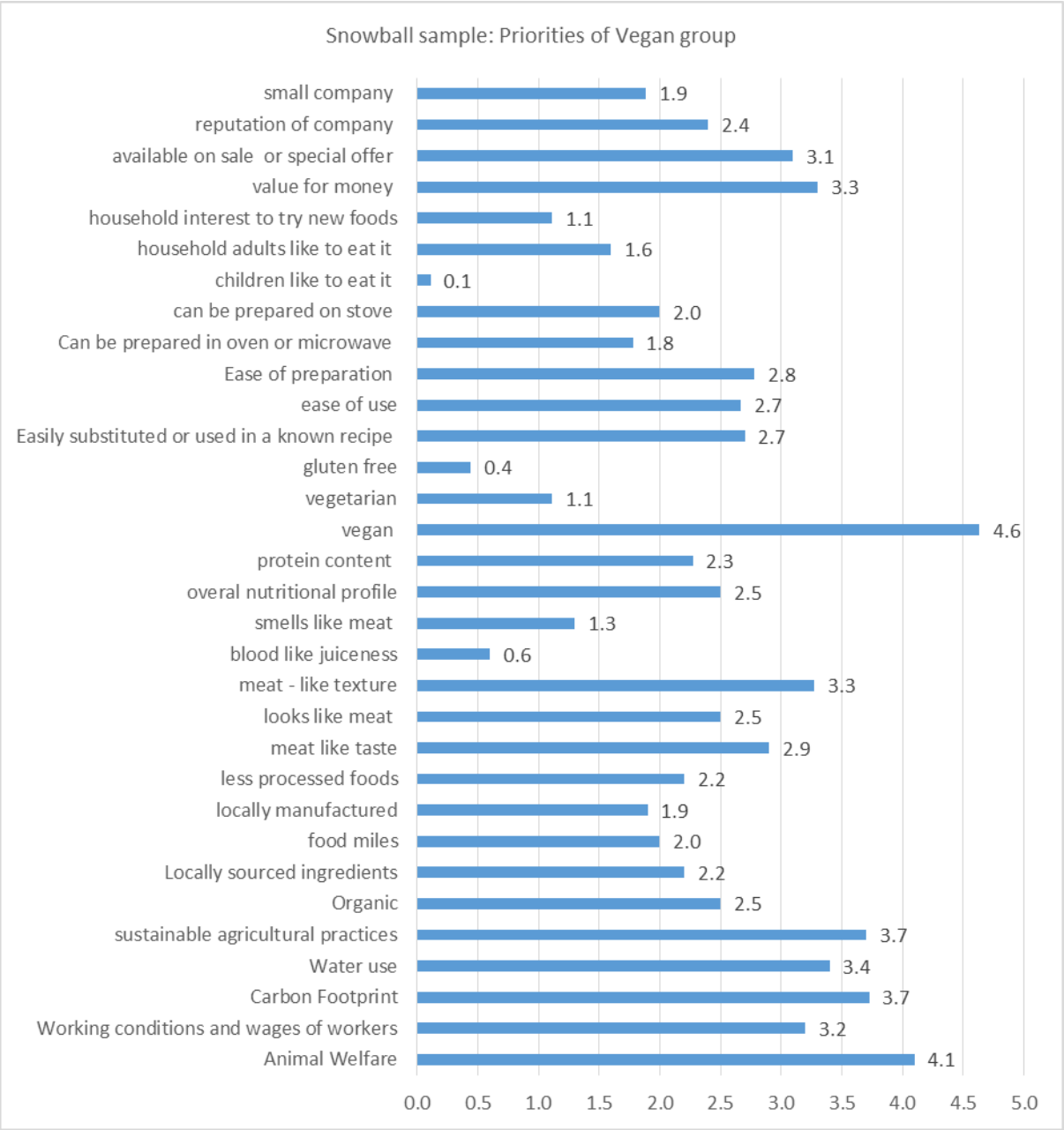

Figure 7.1 Snowball sample: Priorities of the Vegan group

From the above Figure 7.1, it is seen that the top five priorities for vegans in descending order are if the product is vegan, followed by animal welfare, carbon footprint, and sustainable agricultural practices. Others include water use, value for money, working conditions and wages of workers and available on sale or special offer.

Priorities of vegan group from interviews from Snowball sample

The priorities of the vegan group are presented as per respondents from snowball sample.

R1. Vegan, an environmental science master's student in the UK

She became vegan overnight after she watched the documentary Cowspiracy. For her it was important to reduce her carbon footprint for her personal contribution of carbon reduction through behaviour change. She gives the same weightage to health, environmental and animal ethics, unlike the varying ratings seen in the graph above.

She claims that she would look for information on carbon footprint on food packaging, however most companies do not print this information on the packaging. She is generally excited to try a new product and does not check its origin and by default considers a vegan product to be more environment friendly than a meat product. Unlike, other people's opinion about meat analogues being as energy intensive as meat products, she believes that the problem lies with intensive farming to produce animal feed. In her opinion, if the same crop is grown for human consumption, it would not be an issue due to a lower demand.

She also thinks that food waste is an issue that needs to be tackled. People end up buying larger amounts of food due to deals and end up buying more than they need. She was not as familiar with the effects of synthetic fertilizers on the environment and is more concerned about meat consumption and food waste. Food waste is not a component that was included in the survey but was important to R1. It is also surprising that she is not as aware about the benefits of sustainable agricultural practices and ill-effects of conventional farming.

R2: Vegan, A professional woman in the UK

She claims that it was her choice to discontinue consuming meat and dairy products, due to animal welfare and adverse impact on the planet. She tries to avoid food products that are harmful for the environment, but claims that it is difficult and buys locally sourced products as much as possible. For R2, the top priorities for consuming plant-based meat alternatives are environmental impact and animal welfare supporting the graph above.

R6: Vegan, an undergraduate student who leads the vegan society at university in the UK

She learnt about industrial animal farming through Earthlings, a documentary and was vegetarian at that point. Having become very upset by it, she decided to go vegan due to her animal ethics perspective. Her biggest concern is animal agriculture as it leads to multiple issues of environmental sustainability, animal rights as well as animal ethics. While, she ranks

environmental sustainability as her second priority. She believes that feeding food to animals that humans could have consumed is unsustainable. Moreover, animals take up land and use water. She conjectures that most of the food that she buys is grown using intensive agricultural methods and plant-based meat alternatives would have ingredients grown using the same methods.

She would opt out of food products that are intensively farmed, however she is unsure if the alternate system is better. She believes that organic agriculture might be better, but it is resource intensive including human resources and the using up the choicest agricultural locations as it does not use artificial fertilizers. She does think that organic agriculture is a step in the right direction, however, it cannot be practiced everywhere due to lack of soil fertility.

Another concern that she prioritizes are air miles caused from unseasonal foods imported from other countries. Although, she was conflicted about growing produce locally in green houses can be worse than carbon emissions produced from food imports. She was also concerned about use of fertilizers and run-off into rivers that could lead to eutrophication.

R7: Vegan, a woman working with a vegan charity in the UK

She turned vegetarian when she was thirteen due to ethical reasons and primarily for animals. A few years later she later she learnt about the egg and dairy industry and its controversial nature and decided to go vegan. She thinks intensive farming due to the use of pesticides are hugely damaging. She also buys organic produce from a local health food shop, implying that the produce is either local or imported from EU with fewer air miles involved. It serves a dual concern of health and environment for her. Although at times she does indulge in vegan junk food that might have been imported from USA and is not completely rigid but tries to purchase as local and organic as possible.

Another interesting feature that came up is the processed nature of plant-based meat alternatives. Her response is that it isn't as bad as eating processed meat and is not full of hormones and antibiotics and are free from guilt arising from cruelty towards animals. Moreover, she believes that plant-based meat alternatives are an easy source of high protein. Since she consumes them occasionally, she does not consider it a trade-off.

R6: Vegan, an undergraduate student who leads the vegan society at university

In her opinion, trade-offs are made all the time. More often, when she is shopping she doesn't have the time and energy to thinking through these choices. Moreover, there is a lack of information that would even allow her to make an informed choice. It isn't that she would not like to purchase alternatives, however it is difficult to find all the information, if at all, and to choose. Her main trade-offs would be price and availability of items

R4: Vegan, A professional who works for a vegan charity in the UK.

He believes that industrial scale farming has its own set of issues, however they are not as great as animal farming. Also, often the packaging does not have information on carbon footprints, emissions and more, leading to trade-offs without intention. It would be a good idea to be able to gauge emissions from information on food packaging.

Snowball sample: Trade-offs from survey answers and interviews for Vegans

This section presents trade-offs from surveys and interviews

- The best plant-based meat from a taste and texture standpoint does not always have the lowest carbon footprint. One respondent balances these by altering product purchases
- Two respondents mentioned that price of a product has more weightage despite them knowing that environmentally friendly/ ethical/organic products are more expensive
- For two respondents who are vegan for environmental concerns, they don't take the environmental impact of plant-based meat alternatives into consideration
- For another respondent plant-based meat alternatives do not have to be meaty and she would be put off it tasted like meat or bled like meat and thought that it is contradictory for plant-based meat to taste like meat

From both the qualitative and quantitative data for vegans from the snowball sample it is observed that respondents have made dietary choices based on interactions with media and other people. Some of the priorities for the vegan group are carbon footprint, animal ethics, environment, health and even protein source. While other respondents are willing to forgo on the above priorities for price of plant-based meat alternatives and one respondents R4 and R6 believes that due to lack of information consumers are making trade-offs unknowingly, moreover R6 thinks that she does not have the time and energy to think through trade-offs

while she is shopping. The snowball sample is largely associated with vegan NGOs, charities and environmental science students and vegan societies, price can remain a barrier for some respondents and is also ranked at 3.3 in Figure 7.1, while two respondents are unable to consider environmental impact when they are purchasing plant-based meat alternatives.

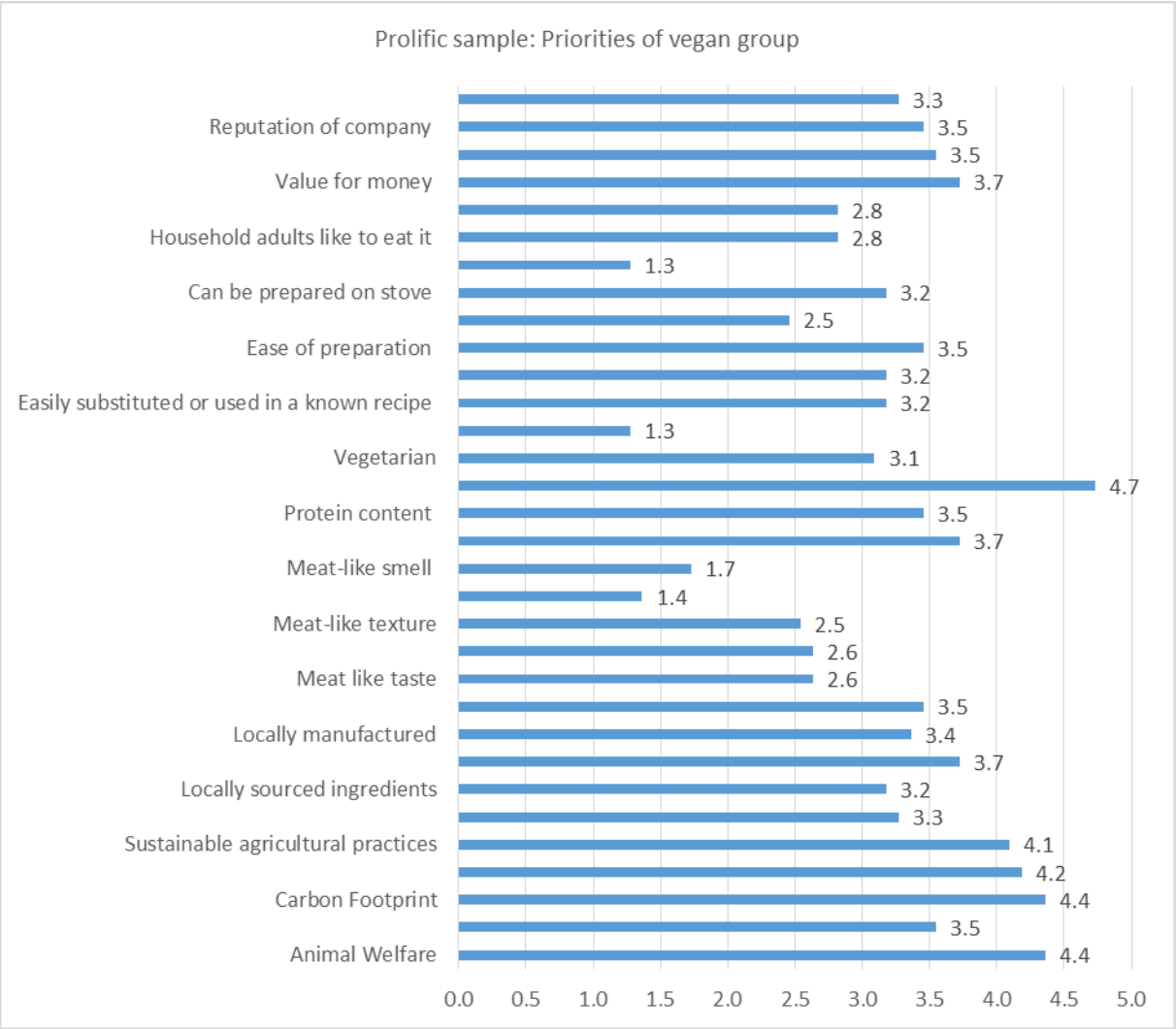

Figure 7.2 Prolific sample: Priorities of the vegan group

From the above Figure 7.2, it is seen that the top most priority for vegan group should be that the product is vegan, followed by animal welfare and carbon footprint at the same level, water used and sustainable agricultural practices also received high priority. While others include food miles, ease of preparation, overall nutritional profile, working conditions of workers and price, availability on sale or offer and reputation of a company among others.

From the Prolific survey sample, some respondents provided their concerns regarding contradictions or trade-offs. One respondent mentioned that a product that tastes like meat is a priority as she liked meat before she went vegan. She thinks that this is the easiest way for her to help the environment. While another mentions that price is a priority and she is willing to trade-off other factors such as environmental impact. Another respondent mentions that she finds it difficult to find small, local organizations that offer vegan options.

It is interesting to note that one of the respondents is looking for small and local organizations that serve plant-based meat alternatives. It highlights that novel products are created for the global markets and are aiming at disruptions (Curtain and Grafenauer 2019), while local cafes or stores are available depending on the location of the person in the UK.

From both the Prolific and snowball samples it is observed that the top five priorities for plant-based meat alternatives are to be vegan (naturally), animal welfare, carbon footprint, sustainable agricultural practices and water use. Whereas taste and texture are priorities for those who liked meat previously, however a higher price associated with the products has led to trade-offs for some respondents from both samples.

Vegetarian group

The vegetarian consumer group based on snowball and Prolific sample is presented below.

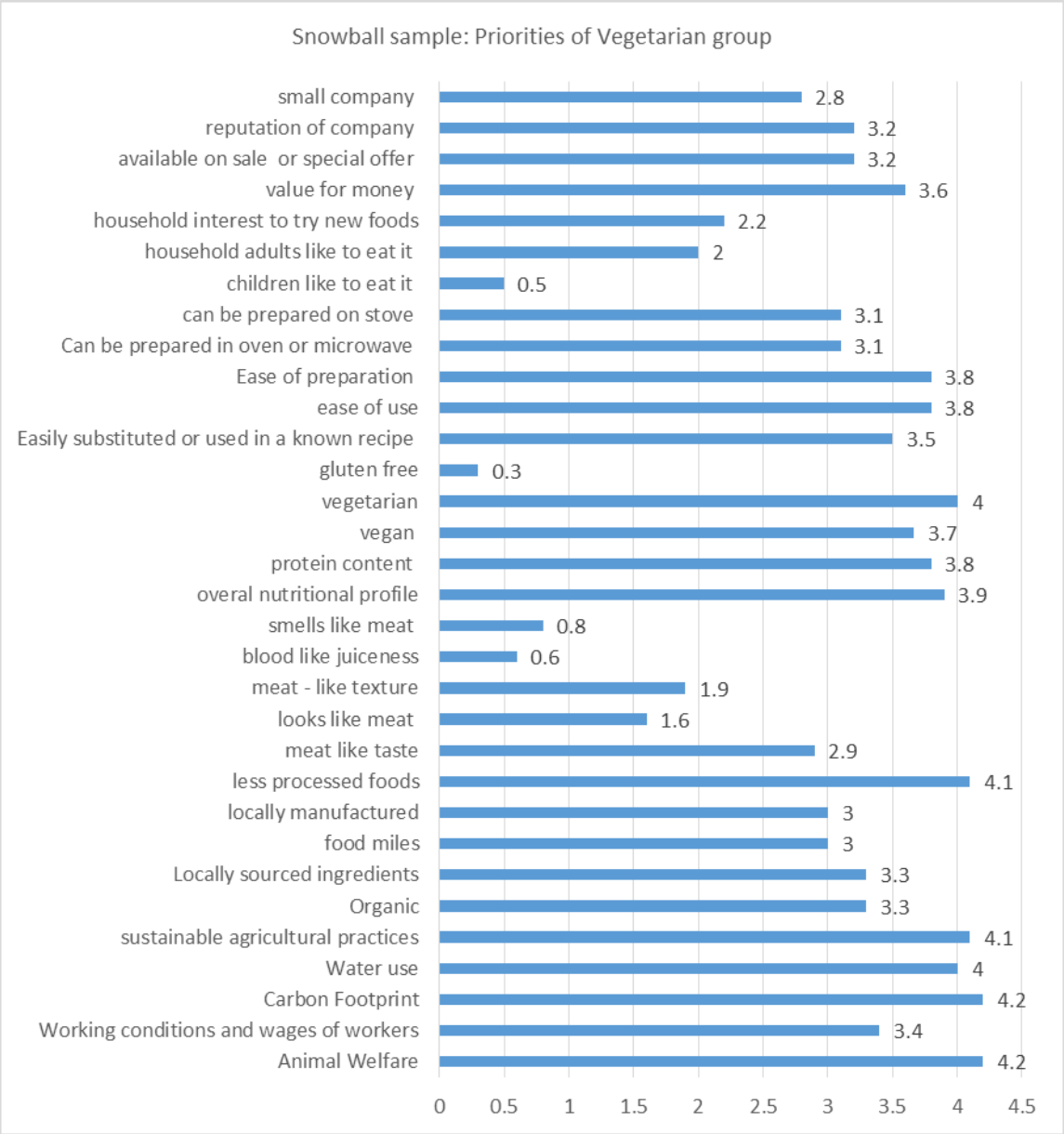

Figure 7. 3 Snowball sample: Priorities of Vegetarian group

From the above Figure, the top five priorities of the vegetarians are animal welfare, carbon footprint, sustainable agricultural practices and less processed foods. While, at the fifth place are water use and of course if the product is vegetarian.

Priorities of vegetarian group from interviews from snowball sample

R5: Vegetarian, an undergraduate student who leads the vegetarian society at university in the UK

Her family members have introduced plant-based meat alternatives and she has been eating them since she was a child. For her the price is a motivational factor and she is looking for a good deal. She would not pay an exorbitant amount of money for plant-based meat alternatives. She finds it difficult to think of animal ethics and environmental impact while purchasing food. She also assumes that since she is vegetarian, the environmental damage of her choices are lower than those of meat products.

R9: Vegetarian and undergraduate student

Her main priority is animal welfare, while environmental impact is not as an important criteria for her. She would prefer to go for organic food option and also consider the nutritional profile of a product. However, price is the deciding factor for her and would trump environmental concern or even health.

R10: Vegetarian and professional

For her animal welfare is a concern followed by environmental sustainability. She claims that she is vegetarian, although she continues to eat fish due to her concern about protein (In detail in the discussion). She also makes exceptions when she is invited to homes of her family or friends for meals and eats meat with them. In turn making a trade-off by allowing social influence to supersede her personal views occasionally.

Trade-offs of vegetarian group from snowball sample survey

- For one vegetarian, he prioritizes nutritional benefits and cost over environmental factors
- While another vegetarian likes more processed foods that are also more meaty such as Quorn
- For another, price and ethics are in conflict. She appreciates the work of small, sustainable businesses with good work practices, however the price difference between a larger manufacturer (example Quorn) and a small business is too large to justify.

After one purchase, if there is no notable difference in quality, she finds it difficult to make re-purchases from smaller businesses

From the snowball sample of the vegetarian group, price presents a recurring conflict and even though it is not one of the highest priorities from the quantitative data, the interviews and qualitative answers from the surveys depicts that price often trumps environmental factors or organic options. While nutrition including protein, less processed nature of plant-based meat alternatives and often more important for vegetarian consumers.

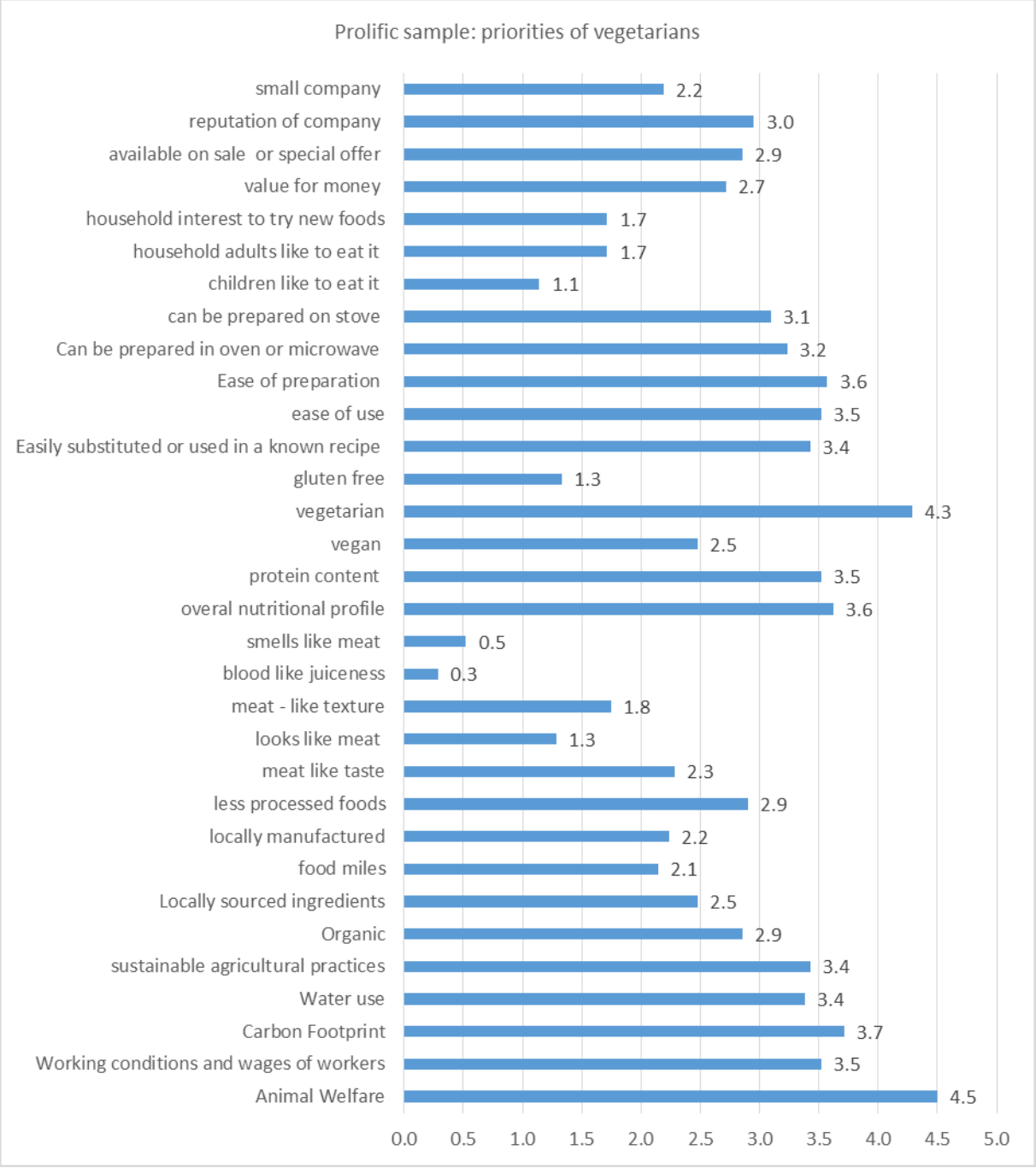

Figure 7. 4 Prolific sample: Priorities of vegetarian group

From the above Figure 7.4, the top five priorities of Prolific sample of the vegetarian group include animal welfare, vegetarian, carbon footprint, overall nutritional profile and ease of preparation.

Priorities and Trade-offs for vegetarian group from the Prolific sample survey

- Price: one of the respondents wrote, "Although I do try to buy from more ethical companies, I cannot always afford to do so, I have to try to get the most amount of meat substitutes for the littlest amount of money that I can" (Survey results). Two other respondents also commented that plant-based meat alternatives are expensive.
- Household adults like to eat it – one of the respondents wrote, "I prioritise on what my partner (also veggie) prefers as he is fussy! Then it goes on what I like best and then taste and nutritional value"
- Taste: One respondent mentioned that she loved the meaty taste but would not eat anything that was bloody or smelt like meat. Conflicting view as smell and taste are connected.

From the Prolific group too, the vegetarians are concerned about the price of plant-based meat alternatives and have end up forgoing environmental ethics for price. While one would not want her plant-based meat alternative to resemble meat and another prioritizes her choices based preferences of her partner/other adult in the household.

The vegetarian group overall prioritizes animal welfare, carbon footprint and the products should be vegetarian. Other another overlapping priority is less processed foods that can be included in overall nutritional profile. While a resonating trade-off for the vegetarian group is caused by price of plant-based meat alternatives.

Flexitarian

The flexitarian consumer group based on snowball and Prolific sample is presented below.

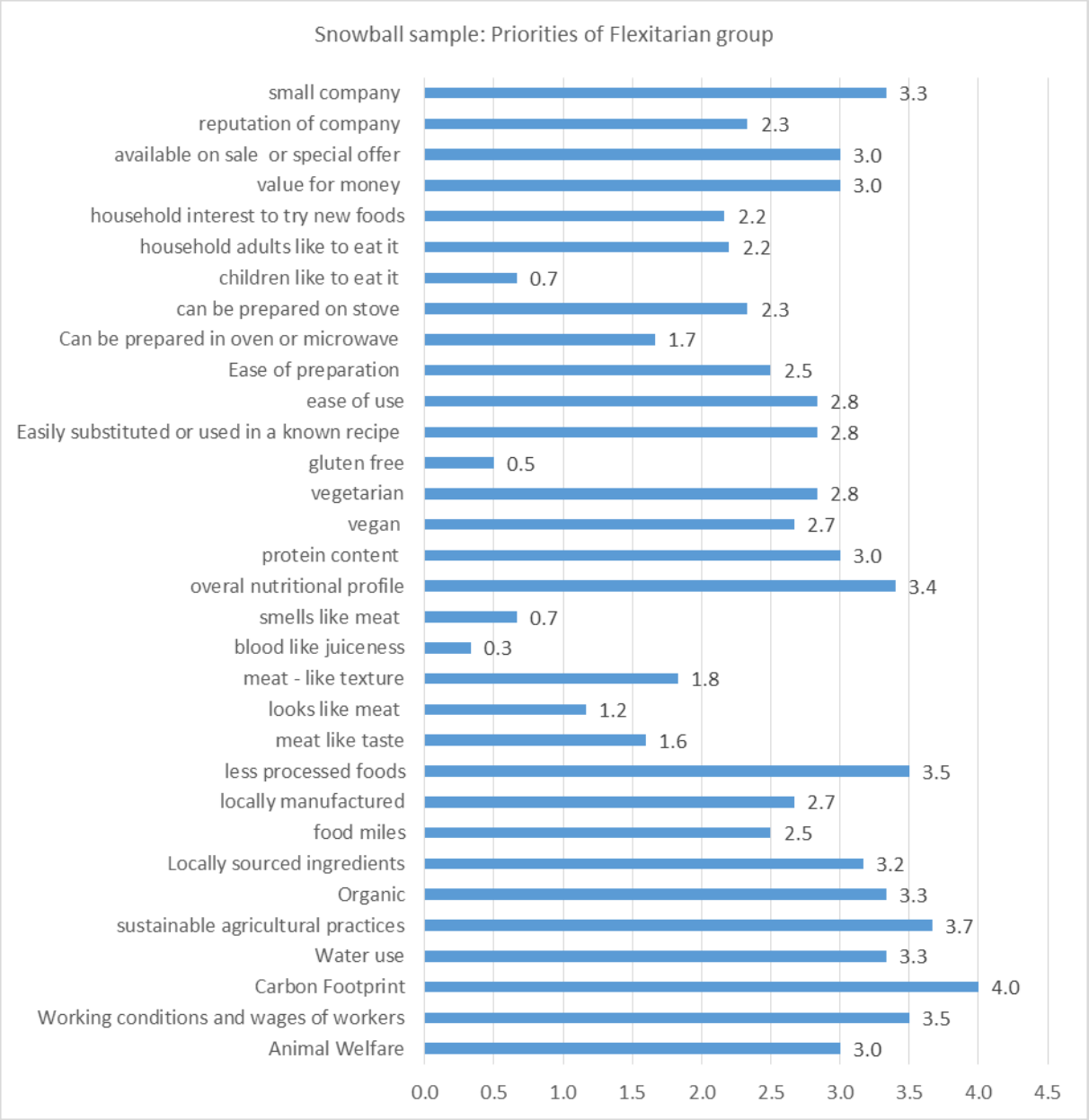

Figure 7. 5 Snowball sample: priorities of Flexitarian group

From the above Figure 7.5, the top five priorities of the snowball sample of flexitarian group are carbon footprint, sustainable agricultural practices, less processed foods and working conditions and wages of workers all three in third place, followed by overall nutritional profile and organic, small company and water use at fifth place.

Priorities of flexitarian group from interviews from Snowball sample

R11: Flexitarian and an academic with research in sustainable food systems

For him the ultra-processed nature of plant-based meat alternatives and the lack of engagement with local food systems is of concern. Moreover, a local product such as mushrooms also has a lower price point. He also believes that intensive farming is seriously problematic, although sustainable intensification has been in the paradigm since twenty years and is a useful tool to consider land use change. Another concern is use of synthetic fertilizers for a soil based economy. Moreover, for a sustainable system it is prudent to think about regional protein sources and regional grains that can be produced rather than being reliant on soya or wheat. For instance, Quorn's feedstock contains potatoes and eggs rather than being just soy, oat or pea reliant. The ingredients of plant based proteins make it as complex as animal based proteins. Moreover, the problem lies in the power structures and the amount of capital and risk an entrepreneur has to take for alternative protein products that are plant based rather than animal based, unless it's a low tech option such as mushrooms.

R12: Flexitarian and a master's student in environmental science

For her food waste in the global north as opposed to food insecurity in poorer parts of the world, similar to ethics of meat consumption as discussed in the literature review. She dislikes pesticide usage in agriculture and tries to buy as local and organic as possible, whereas air miles are also a concern for her. In her experience, plant-based meat alternatives do not have information regarding intensive agriculture or carbon footprint that is well advertised. Often people believe that because they are buying plant-based analogues they would be better than animal products, however it is the case in some but not with others and a case of superb marketing or greenwashing.

The only readily available information on packaging includes organic or place of production. In a hypothetical situation, if all the information was available, the place of production would rank highest as her priority followed by whether it was organic or not. Other issues that concern her include harm of biodiversity and waste generated. She finds it difficult to make a decision in a supermarket or shop unless she has done research beforehand to inform herself. While, another flexitarian mentioned in the survey that taste was a priority for her.

Trade-offs of flexitarian group from interviews and snowball sample survey

- R11: Flexitarian and an academic with research in sustainable food systems

He thinks that it's absurd that while the UK is 30% food insecure, he does not have to worry about food. He has moved to shopping from a food waste community box, the buyer cannot choose what goes into the box and a price is pre-decided to support the local community, he compromises on freshness, choice and durability. He recognizes his privilege and says that he would buy a product like avocados occasionally. Since in comparison to carbon footprint or water footprint is lower in comparison to chicken, not just lamb or beef. He thinks that he could make a bigger difference if he can support a wider range of farmers, buy fair trade and close to geographical country of origin.

- Another respondent mentioned that soya, which is used in the production of plant-based meat alternatives has high food miles, leading to a trade-off
- Another flexitarian mentioned that she looks for ethical products but prioritises price as she in on a student budget

The flexitarian group priorities from the interviews and surveys are carbon footprint, less processed foods, sustainable agricultural practices, organic and overall nutritional profile. However, one respondent claims that it is impossible to gauge sustainable agricultural practices without prior research and there is not information on the packaging. Moreover, from the interviews they would like to support local initiatives. Price is also one of the reasons of trade-off for one of the respondents.

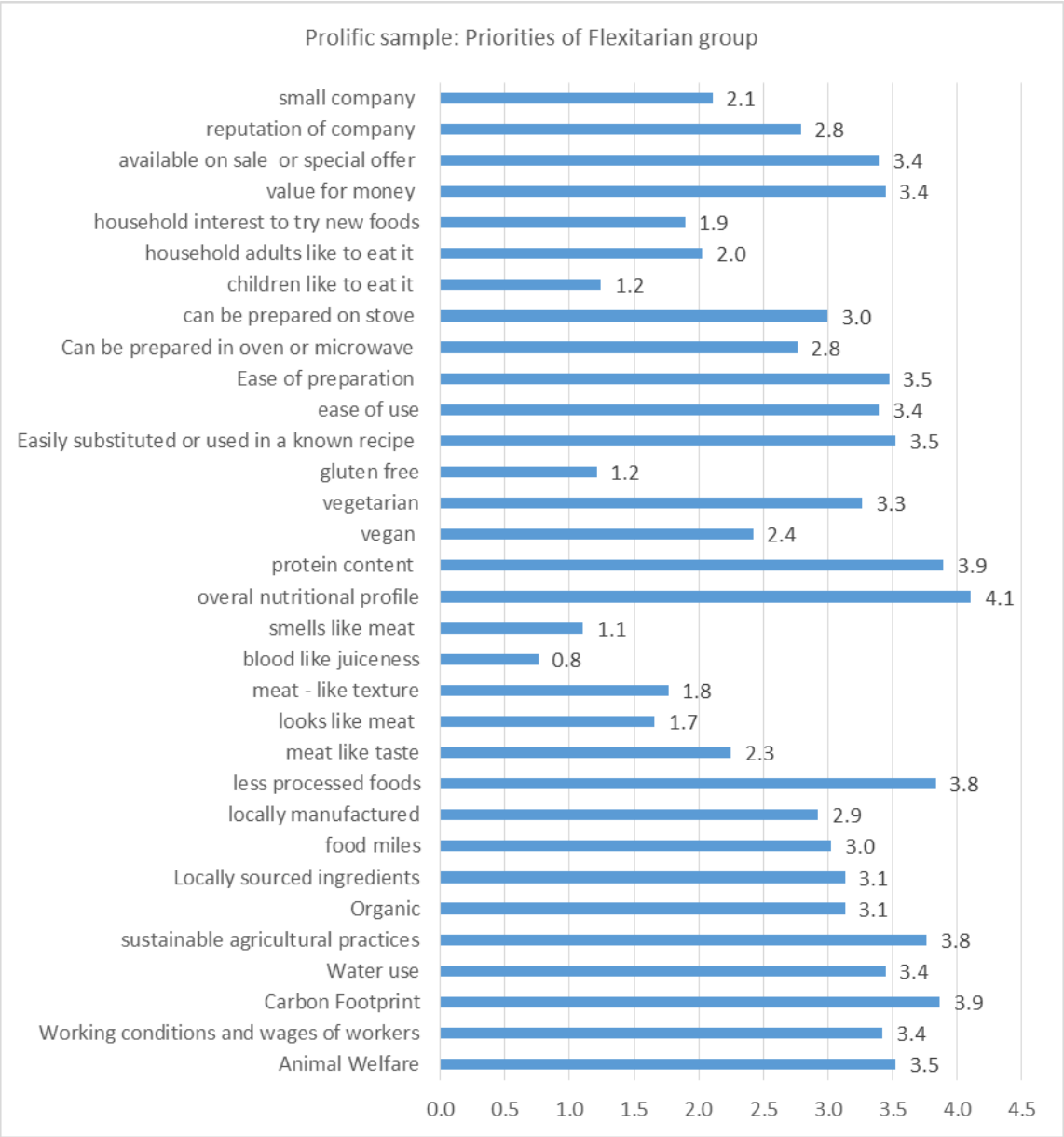

Figure 7.6 Prolific sample: Priorities of Flexitarian group

From Figure 7.6 it is observed that top five priorities are overall nutritional profile, carbon footprint and protein content at second place, sustainable agricultural practices and less processed foods at the third place and animal welfare, ease of preparation and substitutability on a recipe in fourth place and special offer, value for money, ease of use, water use and working conditions and wages of workers in fifth place.

Priorities and Trade-offs for flexitarian group from the Prolific sample survey

- One respondent mentions that health is of primary concern followed by price
- Another respondent mentions that he is concerned about water use, but information is tough to find and she ends up making trade-offs unknowingly

- For another price is the primary driving factor, whereas for another a good quality product is very expensive. For two others, an ethical/organic product that is eco-friendly (less air miles and sustainable packaging) is generally out of their budget
- Availability of the product is also an important factor for a respondent. Another seconds her by saying that she would switch to plant-based meat alternatives if Beyond Burger was more readily available.

The flexitarian group the top priorities included carbon footprint, overall nutritional profile, sustainable agricultural practices, less processed foods and water use. While animal welfare was lower on the priority list in comparison to vegan and vegetarian groups. Price has led to recurring trade-offs trumping organic, ethical and local ideologies, while availability of the products or convenience of purchase is also a concern. Another factor is nature of raw material which intrinsically have higher air/food miles due to intensive agricultural practices and origin from another continent.

Omnivore group

The omnivore consumer group based on snowball and Prolific sample is presented below.

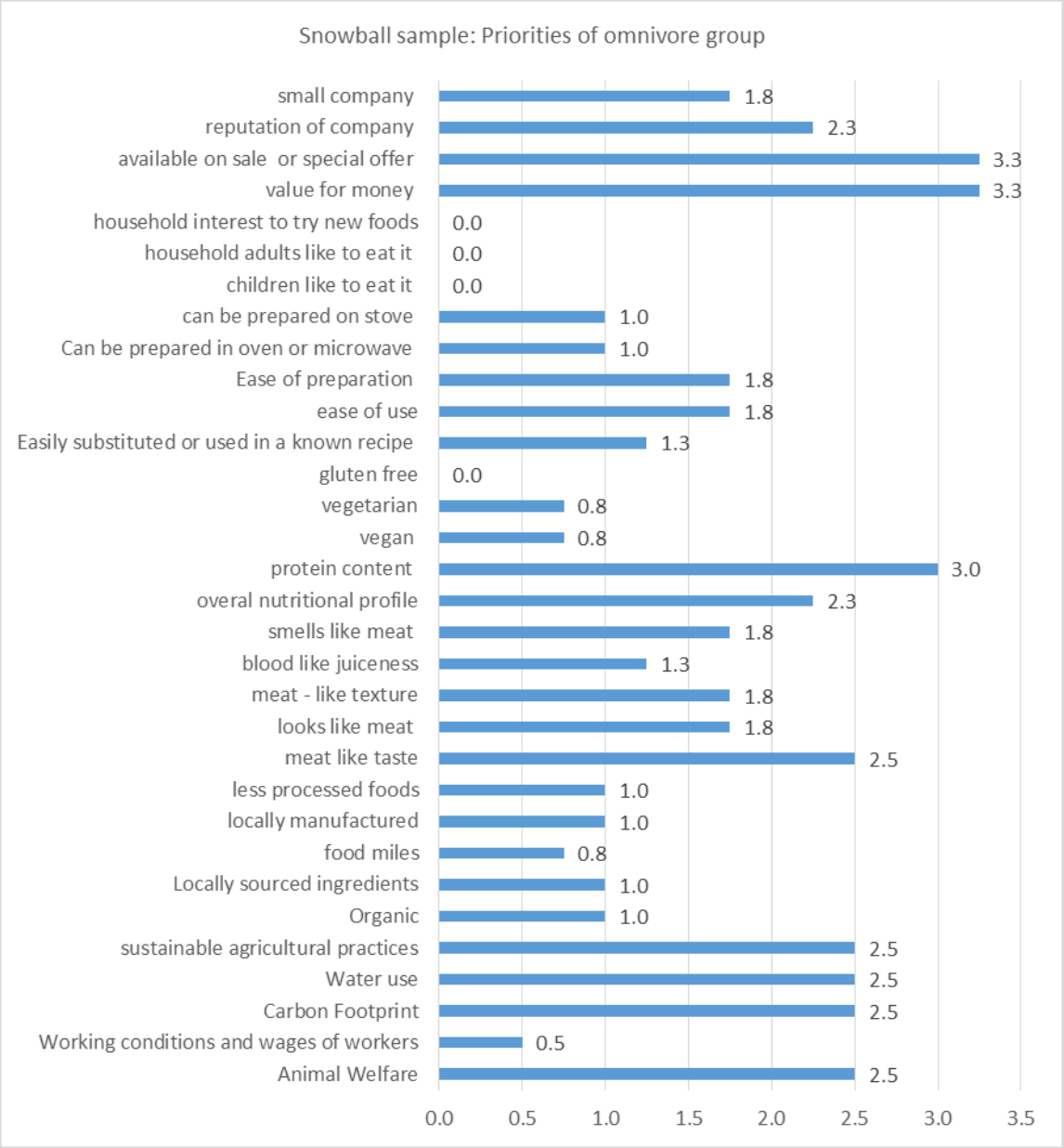

Figure 7. 6 Snowball sample: Priorities of omnivore group

From Figure 7.6, it is seen that the priorities for omnivores are different in comparison to vegans, vegetarians and flexitarians. Their ratings are lower and only those above 2.6 are taken as priorities. The top five priorities include special offer and availability on sale along with value for money in first place, while protein content is in second place. Other factors were rated below 2.6 and have not been included.

Priorities of omnivore group from interviews from Snowball sample

Unlike the survey results the respondents from the interviews have differing opinions about their priorities and trade-off.

R3: Omnivore, a master's student of environmental science who has lived in the UK for a four year period in the past.

He would prioritize the social aspects such as poverty first, then environmental aspects and then finally food quality. One, social impact and issues of intergenerational justice, food accessibility and those that are the poorest and in most rural regions do not have access to food as those in the affluent countries, relating to ethics of meat consumption from the literature review. Moreover, women bearing a disproportionate burden of agriculture. Two, intensive agriculture based on synthetic fertilizers and their impact on greenhouse gas emissions, eutrophication of ground and surface water, land use and loss of biodiversity as well lack of ethical treatment of animals. Three, food quality (or organic farming in this case) the homogeneous mass produced and aesthetically pleasing food is not necessarily nutritious. For instance, he supports organic food systems that produce food through traditional methods and are nutritious and culturally significant for people in particular regions. Apart from these, he also makes informed choices about his diet for personal health.

R8: Omnivore, professional woman and rugby player.

For her environment sustainability is not on high priority, but health has a larger role to play. Although she is conscious about her palm oil consumption after watching a documentary. She doesn't think she has much choice when it comes to the origin of her meat and veg and believes that they are probably farmed in Britain. She consumes plant-based meat alternatives due to their novelty and ease of use when she has guests who are vegetarian or vegan.

Trade-offs of omnivore group from interviews and snowball sample survey

There were no contradictions observed from the survey and only one omnivore mentions a trade-off in his interview.

R3: Omnivore, A master's student of environmental science

If he finds himself craving for a particular food item, regardless of its country of origin or environmental impact, if the product is available he would buy it. His trade-off would be self-interest over animal welfare or environmental sustainability.

The survey data and the interviews do not have coinciding results. Moreover, for one respondent, environment sustainability is not a priority and consumes plant-based meat products occasionally due to their novelty and ease of use when she has guests with vegan or vegetarian preferences. However another omnivore cares about poverty, environmental aspects and food quality. While, in self-interest he would give into a craving and buy food that might not coincide with animal welfare or environmental sustainability. While the survey results mention value for money, product on sale or offer and protein content. It was observed that the respondents did not have the same priorities.

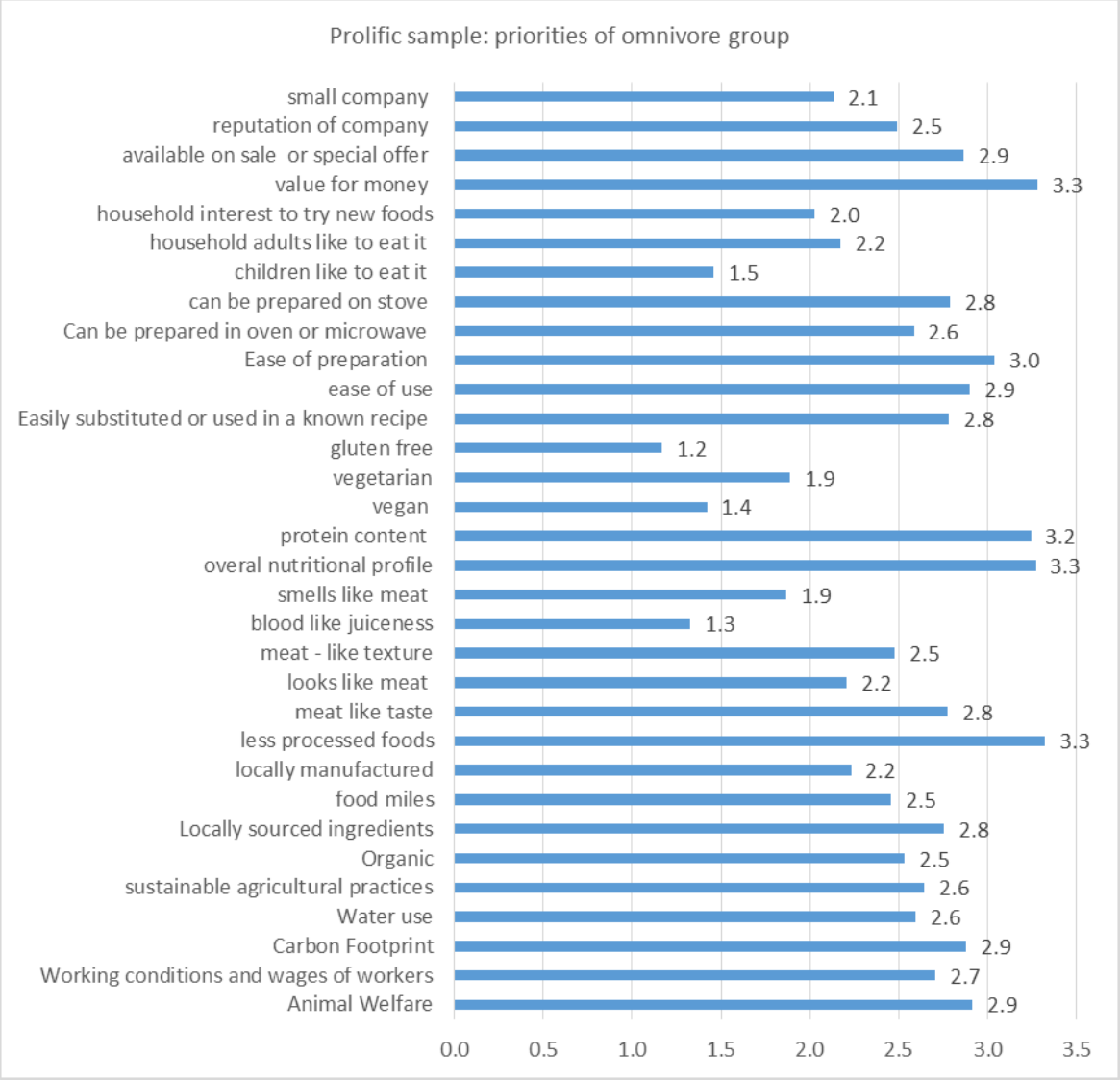

Figure 7. 7 Prolific sample: priorities of omnivore group

From the above figure, the ratings of the Prolific sample vary from the snowball sample. The top five priorities for the omnivore group are value for money, overall nutritional profile and

less processed foods at first place, followed by protein content in second place, in third place the priorities include animal welfare, carbon footprint, ease of use and availability on sale or special offer. While in fourth place, the graph depicts locally sourced ingredients, meat-like taste, substitutability in a recipe and the product can be prepared on a stove. While working conditions and wages of workers in fifth place.

Priorities and Trade-offs for omnivore group from the Prolific sample survey

- One of the respondents mentioned, "If a plant-based meat alternative was SO good recreating the meat experience that would be a purchasing priority. Since no meat alternative actually tastes or feels like meat, it is not a priority" (Survey responses). Another respondent thinks that, "meat alternatives taste like cardboard and he would not try them" (Survey responses). Three others prioritize taste over look and smell.
- Six respondents considers protein content to be a top priority
- For another reputation of the brand and word of mouth is important
- While another finds the price too high and believes that economies of scale are yet to be achieved for plant-based meat alternatives. Four other respondent thinks that plant-based meat alternatives are expensive as well
- For another respondent health and price are priorities
- For one respondent plant-based meat alternatives are used in his household to reduce the impact of meat on the environment and due to animal mistreatment, however it did not remove meat from his diet but has led to a reduction
- Another respondent preferred if his food is sustainable and locally sourced, but did not think as much about the actual carbon footprint or water use when I actually want to buy plant-based alternative food
- Another interesting response was, "It could be a contradiction that value of the product (price) and the ethics towards their workers are both high priority as you could argue to make the prices competitive you have to sacrifice the wages etc. of the workers. I usually have a guide price in my head of what I pay for meat and meat substitutes and have to be able to balance the ethics along with my own income to create a healthy balanced diet. Another contradiction sustainable and locally sourced options vs. price" (Survey results).
- Children's preferences sometimes overrules the desire to be environmentally friendly for one respondent

The opinions of omnivores vary to a great extent for some the taste of plant-based meat alternatives are unacceptable, for others it has helped in reducing their meat consumption. Some consider its protein content as top priority. Other respondents consider the price as too expensive and have forgone ethics as well as sustainably and locally produced options. Yet for another brand value and word of mouth is important for consumption of plant-based meat alternatives. Moreover, one respondent chooses options based on the preferences of her children, which may not always coincide with plant-based meat alternatives. The quantitative data coincide with the qualitative data on meat-like taste, price and overall nutritional content/protein or health.

For snowball sample and Prolific sample, the qualitative priorities and trade-offs have vast differences and so far the omnivore group has received the most heterogeneous qualitative responses. Although, the quantitative data coincide on price of plant-based meat alternatives, their protein content, overall nutritional profile and meat-like taste.

Heavy Meat Eater group

The Heavy Meat Eater consumer group based on snowball and Prolific sample is presented below.

Snowball sample

There were no respondents

Prolific sample

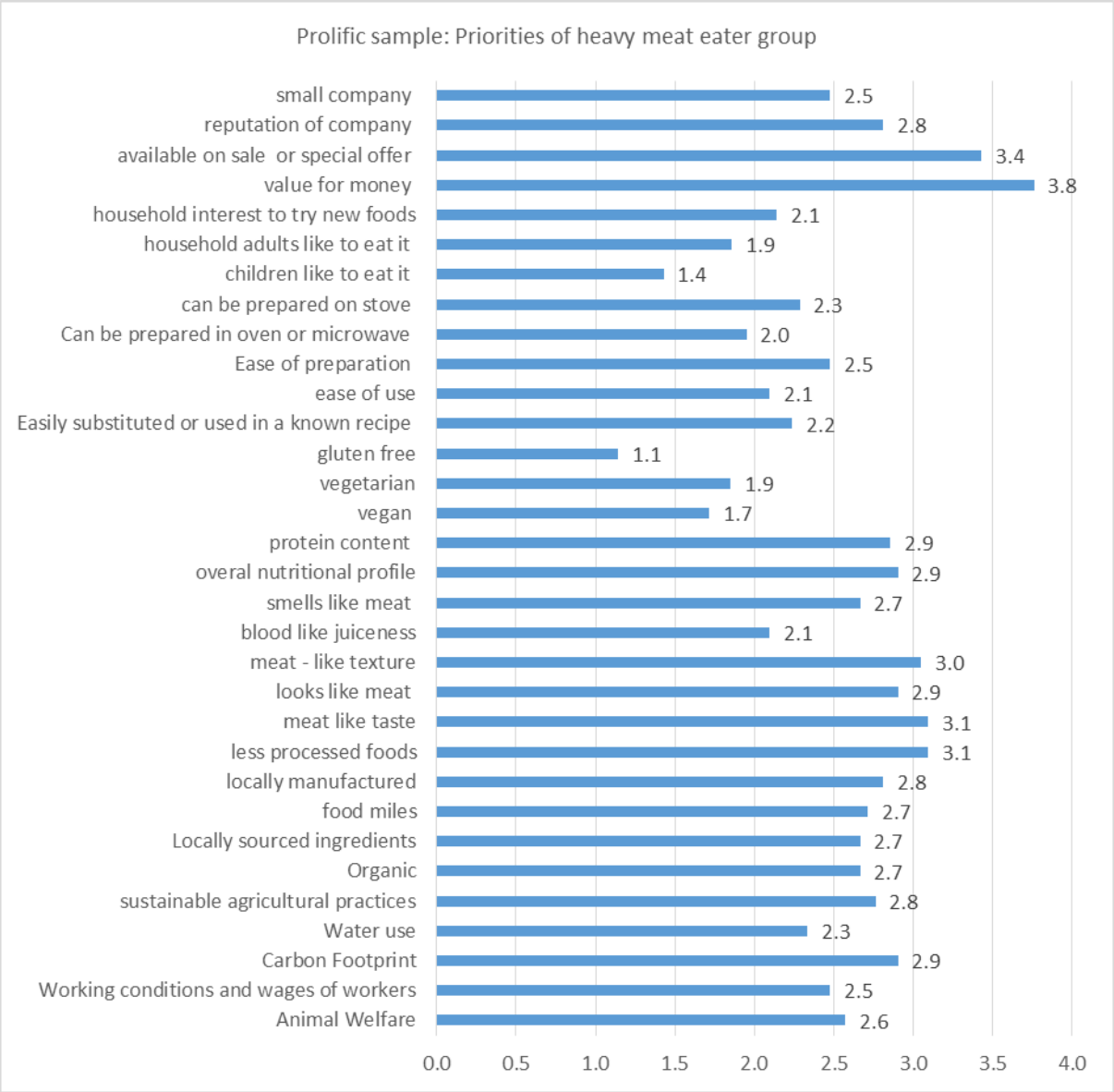

Figure 5. 8 Prolific sample: Priorities of Heavy Meat eaters

From the above figure, the heavy meat eater prioritize value for money, followed closely by special offer or sale on product, less processed foods and meat-like taste in third place, with

meat-like texture in fourth place and protein content, overall nutritional profile, meat-like look and carbon footprint all in fifth place.

Prolific sample: Trade-offs and Priorities for heavy meat eater group

Most respondents did not mention any priorities or trade-offs. One respondent mentioned that taste is a priority, while another mentioned that environmentally friendly products that are high quality are expensive. A contradiction that emerges from the priorities in the above graph is carbon footprint that appears as a fifth priority for heavy meat eaters is contradictory in nature, since meat products are intrinsically more carbon intensive in comparison to plant-based foods. Although consumers can have contradictions between ideologies and purchasing behaviour.

Ultra-processed diet group

This section provides an overview of the ultra-processed diet.

Snowball sample

There was only one respondent and hence this category was underrepresented.

Prolific sample

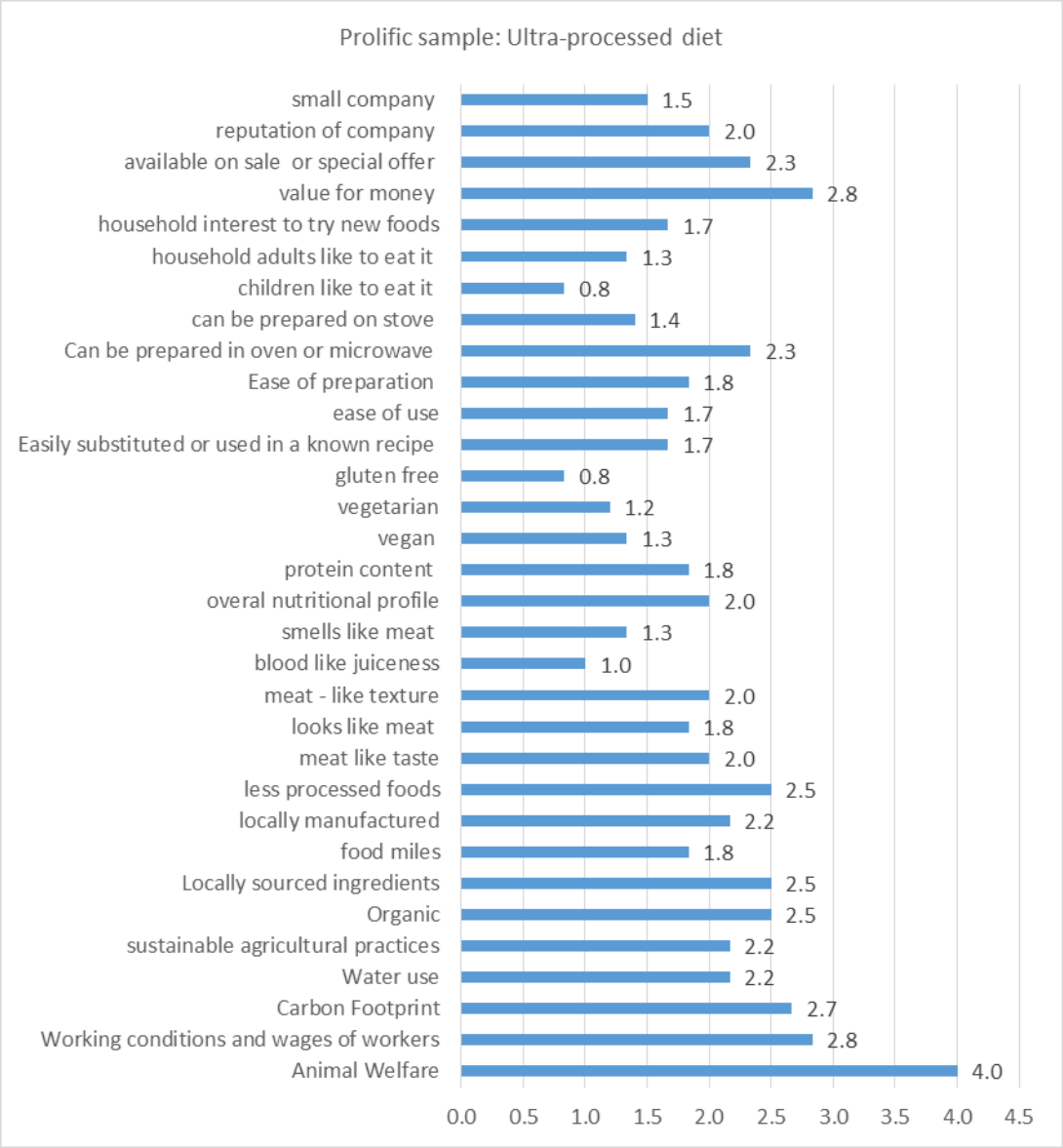

Figure 7. 9Prolific sample: Priorities of ultra-processed diet group

From the above Figure 7.9, the top five priorities that emerge are animal welfare by far the highest priority, while value for money and working conditions and wages of workers at second place, followed by carbon footprint in third place. While the others are excluded as they fall below the 2.6 level.

Priorities and trade-offs for ultra-processed diet group

There was only one response, value of the product or price is of primary importance for this participant.

7.4 Discussion

The in-depth conversations provided contradictory as well as overlapping views pertaining to consumer attitudes towards plant-based meat alternatives. Through the survey and interviews, it was noted that consumer groups have varying priorities with regard to environmental and animal ethics and their food procurement and consumption habits. The respondents apparently believe that they are ethical consumers, however, they either lack information about or cannot retain and weigh multiple factors of land use, carbon footprint, water use, air miles or country of origin and organic produce pertaining to ecological integrity while making food choices at a supermarket or on an online platform.

The main themes that arise for trade-offs from the qualitative excerpts pertain to animal ethics, intensive and industrial farming vs. organic agriculture and air miles. It is interesting to note that some of the respondents believe that if they have given up on meat and other animal products, their impact on the environment is by default reduced. Whereas, other respondents such as R11 and R6 shy away from blanket statements and claim that the environmental impact of food systems, especially plant-based meat alternatives is layered and also dependent on other factors such as water use, air miles, local farmers and ultra-processed ingredients. Other concerns that arise are personal health.

Another interesting feature that was noted from the quantitative data is the contradiction of omnivores having a higher propensity towards animal welfare, while their diet consists of both plant and animal products. Perhaps, they were concerned about the protein levels in plant-based meat alternatives (Szejda et al. 2020), also leads from one of the vegetarian respondent, who should fall within the flexitarian category, is concerned about her protein consumption and eats fish occasionally, explained in more detail under ethnoscape below.

From the literature review, price was one of the primary concerns of consumers, while carbon footprint was a secondary concern among others (Apostilidis and McLeay 2016). From the qualitative data from this chapter, the omnivore and heavy meat eater groups confirm the above claim. However, it varied for vegan, vegetarian, flexitarian and ultra-processed diet groups.

The following scapes are not watertight and interact with each other to lead to attitudes of different consumer groups towards plant-based meat alternatives. The following paragraphs connects the conceptual framework of the alternative meatscape with attitudes of different consumer groups towards plant-based meat alternatives.

Mediascape: Two respondents from the snowball sample, R1 and R6 were influenced by documentaries that made them convert to vegan diets due to concerns regarding not only environmental impact but animal welfare as well. Although factors such as sustainability and animal welfare, are less important to consumers with varying food preferences and are less likely to influence purchasing decisions (Szejda et al. 2020).

Ethnoscape: R10 is a respondent who has partial French lineage and even though she considers herself vegetarian, she eats fish occasionally and meat when she is invited to dinner at a family member or friend's house. It is interesting, how another vegetarian respondent who is of Indian origin and has lived in the UK for more than twenty years, mentioned that she does not have issues with vegetarian food in the UK. However, on a vacation to France, she was once served fish as vegetarian dish. This contrasting view on fish being vegetarian is set in an ethno-cultural scape, where the French even today might consider fish to be vegetarian although in the respondent of Indian-origin does not consider fish as vegetarian, akin to the definition of vegetarian as per this study as well.

Financescape: As seen with multiple respondents across vegan, vegetarian, flexitarian, omnivore, heavy meat eater and ultra-processed diet, price is seen to be a trade-off or a barrier against environmental ethics, animal welfare, health, organic, local and air miles of plant-based meat alternatives. Moreover, Szejda et al. (2020) state that when consumers perceive that their primary driver or expectations of sensory experiences, price of plant-based product are met, then other secondary factors such as health, environmental impact and animal welfare will arise. The authors also state that unfortunately, a decrease in price is a driver and has led to a larger shift to adoption of plant-based meats in Australia.

Technoscape: coinciding with product development leading to sensory experience akin to meat for plant-based meat alternatives. Different consumer groups have heterogeneous views

regarding meat-like texture, meat-like taste, meat-like smell and meat-like look of plant-based meat alternatives, however a majority or close to majority of all consumer groups did not prefer their plant-based meat products to bleed. One of the omnivores mentioned that she would care if her real steak bled but she would be indifferent if meat alternatives bled or a vegan did not feel comfortable if her burger tasted too much like meat. While one vegetarian disliked the meaty texture of her burger and was unable to finish it.

Ideoscape: through chapters 5, 6 and 7 respondents have mentioned that they have either tried plant-based meat alternatives or not. Some respondents who have tried them have done due to influence of household members, novelty of product, convenience of cooking one dish when vegan/vegetarian guests are invited. While others have not tried them and meat is an intrinsic part of their diets, or they don't want to try imitation meat and find it too processed or the texture and taste is off-putting for them.

The five scapes intermingle and have an asymmetrical path that influences consumer perceptions and eventually choices regarding food purchases and food systems. It is observed from the results that consumer groups have varying preferences that have been influenced by multiple factors from the alternative meatscape.

In addition, there are controversies regarding the low environmental impact and allergens present in plant-based meat alternatives, as well as its ultra-processed nature. Some of vegan and vegetarian respondents assume that since the product is free of meat it would automatically be beneficial for the environment. However, they are not only expensive, but energy and materials intensive (Robinson 2018). Unfortunately, the author also states that plant-based meat alternatives have questionable health and environmental impact. The products have not undergone enough testing, have many artificial ingredients and GMOs, whereas an environmentally conscious consumer would perhaps desire a product that is minimally processed, GMO-free, and produced with as few synthetic chemicals.

7.5 Conclusion

This chapter offers an analysis of discourses on the priorities of consumers and the trade-offs that they make in relation to food systems and especially while purchasing plant-based meat analogues. It uses the framework of ethical consumerism and ecological integrity from the alternate meatscape, created especially for this the purpose of this thesis. It provides qualitative excerpts from interviews as well quantitative data from surveys.

It highlighted the main priorities of animal ethics and carbon footprint and discusses the anomaly that arose from the positive ranking of the omnivore groups towards animal welfare. On one hand consumers think that it would be a good idea to have information regarding carbon footprint for instance on packaging, while on the other hand they believe that it gets difficult to make an informed choice while purchasing plant-based meat alternatives. Two respondents also feel that meat analogues use complex proteins and there is not enough information regarding if it is better than meat based food products.

The top priority is animal rights closely followed by environmental sustainability. Additionally, respondents were concerned about organic and local farming systems, air miles, personal health. Moreover, one of the respondents claimed that they did not have enough information to decide if plant-based meat alternatives are better than meat products and believes that brands have superb marketing and offer a kind of eye wash. Whereas, other respondents believe that by turning vegan or on the path of veganism, reduces their environmental impact in comparison if they were consuming meat products. Other priorities that came up include food waste, biodiversity loss, power structures of companies that produce meat analogues and nutritional profile, especially protein content. Consumers often make trade-offs without realizing them or perhaps make uninformed choices due to lack of availability of information. Some of the trade-offs that respondents have made have favoured self-interest, affordability, availability and local food systems.

8. Conclusion

This study aimed at understanding the attitudes of different consumer groups, based on dietary preferences towards pre-existing and novel plant-based meat alternatives in the UK. The conceptual framework of alternative meatscape was created for the purpose of this study.

For RQ1 (How do different consumer groups perceive the sensory experiences and expectations of eating plant-based meat alternatives?). This chapter identifies the top four brands of plant-based meat alternatives that consumer groups have tried namely Quorn, Linda McCartney Foods, Beyond Meat and Impossible Burger/Foods. Since the major difference between brands such as Quorn and Linda McCartney Foods and novel brands such as Beyond Meat and Impossible Foods is that the latter is created to re-invent the meat experience without meat. Attitudes of consumer groups were analysed on sensory factors such as meat-like taste, meat-like smell, meat-like look, meat-like texture and blood-like juiciness. It was observed that within consumer groups, for example vegetarian or omnivore group opinions pertaining to the sensory appeal were heterogeneous.

Pertaining to RQ2 (How do different consumer groups perceive plant-based meat substitutes and their relationship to meat?). In this chapter, the attitudes of consumer groups regarding changes in the demand for meat with the introduction of plant-based meat alternatives were discussed. It also addresses whether different consumer groups perceive plant-based meat analogues as replacements for meat or a as a new product category. In this chapter as well different consumer groups had varying opinions not only between groups but also within groups.

As for RQ3 (How do different consumer groups prioritize factors and identify trade-offs while consuming plant-based meat alternatives?). This chapter explored how consumer groups perceived environmental sustainability and animal welfare primarily, multiple other factors such as sustainable farming methods, water use and more importantly value of product. It analysed the priorities of consumer groups regarding factors that they associates with plant-based meat alternatives, their manufacturing and their companies. Further, which factors were consumer groups willing or unwilling to make trade-offs for. In this chapter, a dissociation was observed between consumer perspectives and their actions or behaviour. While often, consumer groups lacked adequate information to make trade-offs consciously. Moreover,

many respondents mentioned that price was an important barrier and they were unable to recall too many factors while shopping for food.

The primary finding from this study is different consumer groups based on dietary preferences have varying ideologies, expectations and requirements from plant-based meat alternatives. Ranging from desirable sensory experiences, ideas regarding if they are meat substitutes or a separate and new food product to the priorities and trade-offs they make in relation to plant-based meat alternatives. Some consumers are concerned about greenwashing or highly processed nature of the products, while others assume it to be more environmentally sustainable as it is meat-free.

In terms of alternative meatscape, the study highlights how consumer perceptions do not follow a linear path and are constantly interacting and changing with influences from media, finance, ideas, and technology and with ethnicities to a lower degree. Through the lens of mediascape, consumers are often misled about the environmental implications of plant-based meat alternatives. In the case of the UK, consumer groups want more information on product labels.

Since the in-depth conversations were feasible only with the snowball sample, one of the limitations is that opinions of meat-eaters and those with ultra-processed diets did not have as much representation. Further research should consider focusing on the attitudes of consumer groups with higher meat consumption and if these consumers think that plant-based meat alternatives fall within the category of a desirable, healthy and sustainable diet in the UK. Moreover, since price has been leading to a trade-off, it would be interesting to explore an increase in the price of meat through a livestock based carbon tax.

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Appendices

Appendix A

This study used Google forms to create surveys that for Snowball sample as well as Prolific sample. The survey can be accessed via this link - https://forms.gle/3TwtEvMvVH4niExu5.

Appendix B

Questions and script for semi-structured interviews

Hi _____,

Thank you for agreeing to participate in this conversation.

I'm Devisha, I am studying Environmental Science and Policy at Central European University. This interview is being conducted for academic research. This study will explore people's perspectives towards plant-based meat alternatives. I would have liked to have this chat in-person, however in these special circumstances I will try to make you feel as comfortable as possible. I hope this experience will be pleasant and interesting for both of us.

I would like to inform you that I will be recording this for internal note-taking purposes and your personal information will not be shared with any third-party party organization. I hope it's okay with you. (If respondent said yes, then the conversation was recorded)

I know you have given your consent for the conversation, however, if any of the questions make you uncomfortable, you may choose not to answer it or withdraw from the interview at any point.

I. Dietary choices
1. How would you describe your diet?
2. What is the most important factor (s) to you when you choose to eat, buy or cook food?
3. Do you like trying new things?
4. What are the best/ worst new food experiences you remember?
5. What role could or can plant based meat play in your diet?
6. How long have you been vegan/vegetarian etc.?
7. Why are you a vegan/vegetarian/flexitarian etc.?

II. Food procurement
1. Who does most of the food shopping in your household?
2. Where do you typically shop? How often? Why there?
3. How do you decide what to buy on any giving shopping trip?
4. Do you shop for particular foods in different speciality shops?
5. How often do you engage in "impulse buying" in a shop because a new product interests you?
6. What are the main characteristics of a product that would make you try it?
7. What would make you want to try a new plan-based meat alternative?

III. Cooking at home
1. Who does most of the cooking in your household?
2. Do you like to cook? How often do you cook? What types of food or cuisines do you prefer to cook/ eat?

3. Have you tried cooking these food with any plant based meat alternatives? Are there particular types of recipes you think they would be better for?
4. What recipes have you tried with them? Have you seen any particular recipes targeted at these products? Would you appreciate new recipes to try?

IV. Meat vs. plant based meat substitute

1. Do you think of plant-based meats as a substitute for meat or as an entirely different product?
2. Can you describe your sensory experience while consuming plant based meat for your preferred product (If not clear from survey) Please include visuals, flavours, textures, smells and other senses that are attractive or unattractive for you. Do you think plant-based meats should be more like meat in flavour, texture, appearance (bloodiness)? What would entice you more?
3. How similar have you found these products to be to meat? Could you tell the difference/ what is the difference?

V. Social influence

1. Are other people's opinions towards your food habits important to you?
2. Have your food choices been influenced by habits inculcated by your parents or by children or perhaps members that you co-habit with?
3. Do your friends or social group also identify as vegan/vegetarian/flexitarian?
4. Do their food choices affect you or your food choices in any way?
5. Does the spatial setting influence your food choice? – supermarket, someone's house or restaurant etc. Or vice – versa, do your food habits influence where you socialize?
6. When you think of plant based meat alternatives, does it strike you as a luxury food that you would eat out a restaurant or a meal that you would make during the week, or order at home when you don't want to cook?
7. Would you eat meat with vegetarian/vegan friends or eat plant based meat alternatives around your friends who eat meat or to appease others? Why??
8. Have your dietary choices led to any kind of conflict or compromise? How did you react?
9. Can plant-based meat alternatives bring together people with different dietary preferences in your household? (meat eaters and non-meat eater)

VI. Influence through peers- online or offline

1. Do you belong to any online or offline food groups or food meet ups?
2. How do you participate in them (events/ chat groups/ purchasing groups/ etc.?)
3. Have any of them had any discussions or events that touch upon plant based meat alternatives?
4. What was the opinion of the group?

VII. Personal idea about food systems

1. How would you describe the food systems that you are part of? It could be at a global, national or local scale.
2. What are your main concerns about the current food system?
3. Out of these ideas, how would you prioritize them?
4. How do you feel about intensive farming pertaining to cultivation of soya, lentils or other products? In your opinion are these products used through intensive farming to create plant based meat alternatives? How does this make you feel

5. While making food choices, have you made trade-offs For example: chosen organic but imported produce, or healthy but less sustainable (e.g. water thirsty Avocados grown not in the UK, but in other parts of the world) organic meat vs. non organic plant based meat alternative?
6. What are the main conflicts or trade –offs do you face while purchasing plant based meat alternatives?
7. Do you consider plant based meat to be a more sustainable choice than meat? If yes, which factors make it more sustainable for you?
8. Which food trends or policies and how, if any, have encouraged you to make more sustainable food choices or try plant based meat alternatives? How have these policies influenced you?
9. Is it important for you to make informed choices towards diet? Why and how do you make these choices?

VIII. Would you like to add or discuss anything else?