

Louvain School of Management

Strategic analysis of the market for plant-based meat substitutes

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Année académique 2020-2021

M-GEST CEMS

Abstract

At a time when consumers are reducing their meat consumption due to concerns about the impact of such consumption on the environment, health or animals, the number of studies in the literature on this trend towards a diet that we will call flexitarian continues to grow.

However, few studies focus on the emergence of a market driven by the flexitarian trend, i.e. the market for plant-based meat substitutes. In fact, these meat-like but meat-free products are increasingly popular but still have a very small market share compared to meat. What marketing strategies should be adopted to increase the market share of plant-based meat substitutes?

Focusing on the market for plant-based meat substitutes, this work aims to provide some answers to this problem. More specifically, this research will explore the influence of the external environment on this market, the attitudes of the average consumer towards these products, and the importance of product development strategies.

This research has an exploratory nature and the empirical part consists of two qualitative studies.

The first one involved 18 interviews with Belgian young omnivores to explore the reasons behind their attitudes towards plant-based meat substitutes and explore their potential to become regular consumers of these products. The main results showed that young omnivores' motivations towards sustainability do not translate into desired benefits, and several product barriers have been identified which can explain their negative attitudes towards plant-based meat substitutes. However, it has been shown that product development strategies could remove these product barriers.

The second qualitative study was conducted with 14 professionals and experts in order to explore the impact that the external environment could have on the marketing strategies of companies offering plant-based meat substitutes in Belgium, and in order to explore the importance of the product development strategy. The main results showed that the external environment presented opportunities and barriers for their marketing strategies, and that a product development strategy was

essential, but combined with a market penetration strategy with pricing, distribution channel and promotion strategies.

The results can be useful for marketing, strategy and innovation departments of companies operating in the food-industry willing to have an overview of the market and to learn about different marketing strategies to increase the market shares of plant-based meat substitutes.

Keywords: plant-based meat substitutes, marketing strategies, product development, external environment, young omnivores, decision-making process, recommendations, consumer perceptions, desired benefits, attitudes, Belgian, Belgium.

*I would like to thank my supervisor,
Caroline Ducarroz, for her support
and guidance throughout this work.*

*I would also like to thank the people
who agreed to take part in the interviews.
This thesis would not have been done without you.*

*Finally, I would like to thank my family
and friends who have supported me.*

*A special thank you to my mum for her incredible
help throughout the whole process.*

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A. General introduction

A socio-cultural trend is growing in Western societies and has been the subject of extensive scientific study. This trend is the one towards a flexitarian diet, meaning that consumers are willing to reduce their meat consumption due to social concerns about the meat industry. The flexitarian trend is growing and has been the subject of extensive scientific studies. However, few studies focus on the emergence of a market be driven by the flexitarian trend, i.e. the market for plant-based meat substitutes. In fact, these meat-like but meat-free products are increasingly sold but still have a very small market share compared to meat.

There is a growing interest in this market, and it has therefore seemed relevant to take a close look at it, especially as there is not yet so much scientific literature on the strategies adopted in this market. We therefore decided to carry out a strategic analysis of the market. Our objective was to determine what marketing strategies should be adopted in order to increase the market shares of plant-based meat substitutes. It is indeed relevant to look at marketing strategies given the recent nature of the market and the fact that there is a potential to increase the customer base.

In order to reach this objective, we have decided to conduct an explanatory approach based on semi-directed interviews. An explanatory approach was chosen due to the fact that few scientific literature exist on this specific market.

The qualitative study aims at providing an answer to three research questions.

- Research question 1 (RQ1): What are the *external factors* influencing the market for plant-based meat substitutes?
- Research question 2 (RQ2): What can explain *young omnivores' attitudes* towards plant-based meat substitutes?
- Research question 3 (RQ3): To what extent is *product development* a relevant marketing strategy to accelerate the growth of the market for plant-based meat substitutes?

The qualitative study also aims at exploring to what extent the external environment (RQ1) influences marketing strategies. And starting from young omnivores' attitudes towards plant-based meat substitutes (RQ2), to what extent does this consumer group represent an opportunity in terms of potential consumer target for companies offering plant-based meat substitutes?

Our study is structured in 4 main sections.

The initial section is a review of the literature, divided into 4 main sections. The first section deals with the context of the market for PBMS, and presenting its potential and growth. This following section focus on the external factors influencing the market, by following the *strategy framework* of Gailly (2020)¹ (See Appendix 1). Then, the decision-making process of omnivores with regard to these products, and finally the different marketing strategies with a focus on product development strategies will complete the literature review.

Another section presents our qualitative study in three parts. First, a presentation of the methodology that was applied, followed by two separate analyses of our two sets of interviews.

The first exploration concerns a group of young omnivores who do not consume substitutes, who were interviewed in order to understand the reasons behind this choice. Their motivations and desired benefits with respect to food products, as well as their perceptions of plant-based substitutes will be analyzed in this section. The second exploration focuses on market professionals and experts in order to understand the effects that external factors may have on their activities, as well as to explore marketing strategies to stimulate the market.

In the final section, a theoretical closure will be brought to our research. It will address specific points of attention regarding the trends that have emerged, managerial recommendations arising from our findings, and limitations and directions for future research.

¹ Gailly, B. (2020, September-October). *Corporate & Innovation Strategy* [Slides presentation]. Corporate & Innovation Strategy, Louvain-La-Neuve, Belgium.

B. Literature review

B.1 Presentation of the market for plant-based meat-substitutes

This first section will present the market for plant-based meat substitutes (PBMS), starting with an overview of the food industry and ending with more precise definitions and information on this growing market.

B.1.1 Food System

According to the Food and Agriculture Organisation (FAO) (Nguyen, 2018)², food systems (FS) include ‘the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries’. Activities of these actors have an impact on the economic, societal and natural environments of our society (Nguyen, 2018), and have the essential responsibility to feed the world. A simple agri-food supply chain can be mapped with these stages (See Appendix 2) (Viira, 2017):



Moreover, the FAO has divided the agricultural sector into 4 sub-sectors: Crop Farming, Fisheries & Aquaculture, Forestry, and Livestock (FAO, n.d)³.

B.1.2 Protein-rich plants: Feed and Food segments

The production of protein-rich plants (PRPs) is part of the crop farming’s sub-sector (FAO, nd). PRPs can be grouped into 4 main categories of proteins: legume and pulse proteins, leaf proteins, cereal proteins, and oilseed proteins (Kyriakopoulou et al., 2019). Each category has diverse sorts of PRPs (See Appendix 3). According to the Harvard School of Public Health (n.d)⁴, these proteins have the potential to ‘replace animal-based protein food products, while providing other essential nutrients.’

² <http://www.fao.org/3/ca2079en/CA2079EN.pdf>

³ <http://www.fao.org/rural-employment/agricultural-sub-sectors/crop-farming/en/>

⁴ <https://www.hsph.harvard.edu/nutritionsource/elevate-your-plate/hearty-and-savory-plant-based/>

In Europe, this production is dedicated to two markets of different types of plant-based products: human food and feed products (Agrosynergie, 2018)⁵. Plant-based feed products, dedicated mainly to aquaculture and livestock, account for 97% of the total protein-rich plant production in Europe, whereas the food segment accounts for only 3% (Agrosynergie, 2018) (See Appendix 5).

The processed plant-based protein products are one of the 3 market sub-segments of the food segment, along with pulses (f.i lentils) and functional protein ingredients (Agrosynergie, 2018). Pulses are sold as whole grains and are either cooked as such by end-consumers or added to ready-to-eat meals (Agrosynergie, 2018). Functional protein ingredients are a business to business segment, and are used by food companies producing meat alternatives to meet technical or nutritional needs (Agrosynergie, 2018). Finally, processed plant-based protein products are sold to end-consumers. They include for instance: preparation of pulses, animal products alternatives or pulse-based snacks (Agrosynergie, 2018). As a consequence, PBMS are included in the processed plant-based protein products.

B.1.3 Plant-based alternatives

According to the Cambridge Dictionary (n.d)⁶ plant-based food can be defined as ‘food consisting or made entirely of plants, or mainly of plants’. The European Commission (2018) defines plant-based alternatives as products based on raw materials from the PRPs production, which is their main specificity compared to animal-based products. As an example, dairy alternatives are defined as food products that are made from plant-based milk instead of their usual animal products (Leialohilani & de Boer, 2020).

Plant-based alternatives are products explicitly created and marketed with the purpose of functionally replacing animal-based products (Geijer & Gammoudy, 2020)⁷. In addition, Tziva et al. (2020) consider that plant-based alternatives aim specifically to resemble the original products. Sensory aspects thus play an important role as these alternative products aim to have an appearance, texture, smell and

⁵ <https://doi.org/10.2762/022741>

⁶ <https://dictionary.cambridge.org/fr/dictionnaire/anglais/plant-based>

⁷ <https://think.ing.com/reports/growth-of-meat-and-dairy-alternatives-is-stirring-up-the-european-food-industry/>

taste similar to animal-based products. According to a report of ProVeg International (2020a)⁸, plant-based alternatives appear to be currently available in all animal-based products' categories: meat, processed meat, eggs, fish, cheese, butter and dairy products.

B.1.4 Plant-based alternatives: Evolution

Some plant-based alternatives have been on the market for decades (Geijer & Gammoudy, 2020). The broad category of plant-based alternatives consists of two types of products. On one hand, some products have been on the market for decades such as falafel, tofu, soy drinks, and margarine. (Deloitte, 2019 ; Geijer & Gammoudy, 2020). On the other hand, new generations of products can be found in most of the retailers since 2015, such as plant- based meat or dairy substitutes (Geijer & Gammoudy, 2020). In general, the plant-based alternatives produced and available in the European Union (EU) did not exist or were hardly represented in retail stores 10 years ago (Agrosynergie, 2018).

B.1.5 Plant-based meat substitutes: Definition

It is important to note that tofu and textured soy protein products (e.g. tempeh and seitan) are sold as meat substitutes in Europe since the 1960s (Geijer & Gammoudy, 2020; Curtain & Grafenauer, 2019).

Several studies show that the consumer target group of PBMS has moved from niche to mass market due to growing social concerns on the impact of the meat industry on the environment, health and animal welfare (Curtain & Grafenauer, 2019; Deloitte, 2019⁹; He et al, 2020). As a result, PBMS are now designed specifically to be attractive for meat-eaters (Curtain & Grafenauer, 2019) who were not satisfied with the sensory aspects of traditional meat substitutes like tofu (He et al., 2020).

The evolution to a mainstream market started with the introduction of Quorn products (See Appendix 5). These products were developed in the 1980s and became increasingly popular in the UK, and later in the rest of Europe and in the USA (Elzerman et al., 2013). A study by McIlveen et al. (1999) showed that the main reasons for the larger acceptance of these PBMS were the texture of Quorn mimics chicken meat texture. The product was also marketed as a mainstream product instead of targeting the vegetarian niche market.

⁸ <https://proveg.com/plant-based-food-and-lifestyle/vegan-alternatives/>

⁹ <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/consumer-business/deloitte-uk-plant-based-alternatives.pdf>

As a consequence, different types of processed meat substitutes are now available on the market. Carsten et al. (2018) categorised these products into 5 different types:

- **Classic vegan replacements** (i.e. tofu, tempeh, seitan or jackfruit), also known as traditional processed plant-based protein products (He et al., 2020),
- **Classic vegetarian replacements** made of plant-based ingredients but still containing animal ingredients such as eggs, milk, or gelatine,
- **Insect-based meat replacements** made of insect proteins, mainly from mealworms and crickets,
- **Novel vegan meat replacements** completely made of plant-based ingredients,
- **Cultured meat**, created through exponential cell growth in laboratories.

Carsten et al. (2018) insisted on the meat similarity characteristic to differentiate these products, and consider it as a factor to increase their potential to become popular and mainstream (See Appendix 6).

The classic vegan replacements such as tofu score very low in terms of meat similarity whereas novel vegan replacements and cultured meat are very similar to meat products in terms of sensorial aspects (texture, taste, smell, and appearance) (Carsten et al., 2018). Some classic vegetarian replacements are also similar to meat products. The scope of our study will be on novel vegan meat replacements and classic vegetarian replacements, that we considered as the plant-based meat substitutes (PBMS). Well known examples of these products are the plant-based burgers developed by American companies - Impossible Food and Beyond Meat, or the plant-based nuggets from the Dutch brand Vivera (See Appendix 9).

PBMS are also known as meat analogues. Meat analogues encompass both PBMS and cultured meat (He et al., 2020). In fact, Dekkers et al. (2018) consider meat analogues can replace meat products in their functionality by having similar product and sensory properties, and by preparing and eating them in the same way as if they were meat.

In terms of variety, PBMS now exist for several meat products such as burgers, steaks, minced meat, sausages, chicken, nuggets, cold cuts, and are displayed on supermarket shelves generally alongside meat in the chilled cabinets (Curtain & Grafenauer, 2019).

B.1.6 Growing market

Although there has been a rise in the availability of PBMS in the past 5 years, the market is still in a relatively early stage and therefore offers room for further growth (Deloitte, 2019).

According to Deloitte (2019), the European market for PBMS accounts for around 40 per cent of the global market. Between 2010 and 2019, the European market for PBMS experienced a growth of 121% (See Appendix 8) (Geijer & Gammoudy, 2020). In 2018, the Belgian market for plant-based food alternatives accounted for 7% of the total market for PRPs, and the segment experienced a 8.4% growth in 2017 (SoCoPro et al., 2018).

Moreover, further growth is expected. The European market for PBMS is forecasted to grow to €2.4bn by 2025 from €1.5bn in 2018 (Deloitte, 2019; Geijer & Gammoudy, 2020). Geijer & Gammoudy (2020) forecast that the European market for PBMS will grow at an annual rate of 10% in the coming years.

The growth can be explained by the current low market shares of these products. In fact, PBMS retail sales remain low in comparison to the meat category in the EU (Geijer & Gammoudy, 2020). In 2019, PBMS accounted for 0.7% of the total retail sales of meat in the EU (Euromonitor in Geijer & Gammoudy, 2020). According to a report from Carsten et al. (2018), the global meat consumption rate (including PBMS) will grow at 3% between 2025 and 2040. The same study forecasts a market share of 10% for PBMS, 90% for conventional meat and less than 1% for cultured meat in 2025. In 2040, they forecast that the market share of conventional meat will decrease to 40%, PBMS will account for 25% and will be surpassed by cultured meat and its 35% market share (See Appendix 9) (Carsten et al., 2018). Another report by Geijer & Gammoudy (2020) considers it would take until the mid 2050s before sales of plant-based alternatives for meat substitutes could surpass sales of meat and dairy.

Taking into account its market share, as well as the share of PRPs dedicated to PBMS, it seems that the market for PBMS is still in its infancy. Moreover, it appears that this emergent market will experience growth due to its external environment, which will be reviewed in the following section.

B.2 External environment of the market

In general, the external environment can provide proper conditions to achieve specific strategies (Yüksel, 2012). Several external factors appear to influence the market for plant-based meat substitutes (PBMS).

The purpose of this section is to review the external drivers, as well as the external barriers in the market for PBMS. This section will follow the PESTEL framework mentioned by Yüksel (2012) There are six different external factors: the political, economic, socio-cultural, technological, environmental, and legal ones (Yüksel, 2012). It is also considered as the 'External Environment' part of the 'Strategy' framework given by Gailly in his 'Corporate Innovation Strategy' class (2020) (See Appendix 1).

In the next sections, several examples of external factors will be presented to give an overview of the external environment of the market for PBMS. A summarized overview PESTEL can be found in Appendix 10.

B.2.1. Political & legal factors

Political factors cover different forms of government interventions and lobbying activities (Ho, 2014). They complement the legal factors that cover what is allowed within the territories the companies operate in (Oxford, n.d)¹⁰.

According to Spiller and Nitzko (2015), there are different political and legal factors impacting the plant-based sector. These policy measures can be divided into three categories: regulatory mechanisms, consumer education, and financial incentives (Spiller and Nitzko, 2015).

B.2.1.1 Regulatory Mechanisms

EU Food Legislation

According to Leialohilani & de Boer (2020), the EU food legislation and regulation is expected to affect the market for plant-based alternatives.

¹⁰ <https://blog.oxfordcollegeofmarketing.com/2016/06/30/pestel-analysis/>

An EU ban on plant-based alternatives calling themselves milk, cream, butter, cheese or yoghurt exist (Carrington, 2020)¹¹. In parallel, ‘meaty names’ such as ‘vegetarian chicken nuggets’ or ‘plant-based burgers’ have faced many criticisms (Domke, 2018). In fact, certain stakeholders, such as farming and meat lobbyists, are calling for a legal ban on these animal-related terms for vegan and vegetarian alternatives, considering that plant-based producers are ‘cultural hijackers’ misusing animal-products names and therefore misleading the consumers in their purchase intentions (Carrington, 2020). These policies can be considered as barriers as food labelling can influence and guide the consumers purchase and decisions (Domke, 2018).

Subsidies

The EU allocates subsidies to livestock farming which makes meat products cheaper than their ‘real price’ (Kateman, 2021; Stoll-Kleemann & Schmidt, 2017). It could be seen as an external barrier as PBMS compete with meat products.

B.2.1.2 Education

Food Based Dietary Guidelines in Belgium

Regarding consumer education, political institutions could impact the plant-based sector by publishing food-based dietary guidelines (FBDG). The last FBDG published in Belgium raised awareness in the general public on the plant-based diet, and on the plant-based alternatives. Four consumers’ guidelines could have a potential impact on the market for PBMS. In fact, according to the CSS (2019)¹², the Belgian population should: increase its consumption of leguminous plants in order to increase the diversity of protein sources, reduce its meat consumption by consuming alternatives, increase its fish consumption, and avoid any consumption of processed meat (e.g. charcuterie).

Influence of associations

According to Deloitte (2019), NGOs and associations’ actions and campaigns are a driver towards more consumers’ education and willingness to reduce their meat consumption.

An example is the actions from EVA ABSL, a Belgian association promoting plant-based diets.¹³ They

¹¹ <https://www.theguardian.com/environment/2020/oct/16/eu-ban-veggie-burger-label-parliament-vote-meat>

¹² https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/20190902_css-9284_fbdg_vweb.pdf

¹³ <https://www.evavzw.be/fr>

have launched several campaigns to raise awareness, one of which one called *Jeudi Veggie*. The principle was simple: ‘Each Thursday, you go veggie’. Following this campaign, 40% of the participants have ceased to eat meat during several days of the week.

Moreover, animal welfare rights groups have gained significant traction and the ways in which animals are treated has caused a switch in consumer preferences towards meat reduction (Deloitte, 2019).

B.2.1.3 Financial incentives

Funds allocated by the European Union

According to the European Commission (2018), the EU relies currently on a 65% dependence for its PRPs - 17 million out of the 27 million tonnes consumed for both food and feed products are imported (Agrosynergie, 2018). The same study considers that the gap will be reduced in the long run through the Common Agricultural Policy (CAP)¹⁴ financing an agricultural shift towards the production of PRPs (Agrosynergie, 2018).

In Belgium, the Walloon government elaborated a strategic plan from 2018 until 2030 to increase and develop the production of PRPs in Belgium (SoCoPro et al., 2018)¹⁵. The Belgian region aims to become ‘a major producer of meat substitutes’ and ‘take 5% of the EU market for PRPs (Hope, 2021)¹⁶. They would benefit from the EU’s Recovery and Resilience Facility funding to face the COVID-19 crisis and encourage the green and digital transition (Hope, 2021; European Commission, n.d)¹⁷.

Research & Development

The Walloon strategic plan also includes industrial and academic research projects. Universities and the industry could benefit from research funding on priorities regarding the supply chain - production, processing and profitability - of the PRPs (SoCoPro et al., 2018).

After having reviewed different political and legal factors, it seems that the EU and the Belgian policies could act as market drivers by financing research and development (R&D), producing more PRPs, and educating the consumers. On the other hand, some of the regulatory mechanisms of the EU seem to

¹⁴ https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/cap-glance_en

¹⁵ https://socopro-asbl.be/filagri/wp-content/uploads/sites/2/2019/11/Plan_de_developpement_strategique_proteine_vegetale_horizon_2030.pdf

¹⁶ <https://www.brusselstimes.com/news/business/154764/wallonia-aims-to-become-major-producer-of-meat-substitutes/>

¹⁷ https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en

be a barrier to the growth of the market for PBMS.

B.2.2 Economic factors

According to Ho (2014), economic factors cover 'the macroeconomic conditions of the external environment'. As suggested by several sources in literature, some economic factors could be considered as market drivers: the level of purchasing power, and the increasing level of competition in the market.

B.2.2.1 Purchasing power in Europe and in Belgium

As seen in section B.1.1.5, the European market for PBMS leads the way in terms of market size. However, a map of the EU provided by the report of Geijier & Gammoudy (2020) shows some disparities between European countries in terms of consumer spending on PBMS (See Appendix 11).

According to the European Commission (2018)¹⁸, these disparities could be partly explained by the fact that incomes are higher in these specific regions than in the rest of Europe. A higher purchasing power would then drive the market for PBMS, which could to be the case in Belgium.

The purchasing power of the Belgian population has increased over time since 1960 (Defeyt, 2020)¹⁹. However, the share dedicated to food expenses has decreased over time to stabilize around 11% (27% in 1960) since 2000 (Defeyt, 2020). Some key trends highlighted by Defeyt (2020) could potentially impact the consumption of PBMS, by comparing 1980 to 2020:

- Decrease in the share of meat: 36,3% to 22,3% of their budget for food expenses;
- Increase in the share of seafood: 3,9% to 6,8% of their budget for food expenses;
- Increase in the share of ready meals: 2,6% to 8% of their budget for food expenses.

B.2.2.2 Merger & Acquisition

According to Deloitte (2019), mergers and acquisitions are considered as PBMS market driver. Inorganic growth is happening in the market through the acquisition of disruptive brands and products (Geijier & Gammoudy, 2020).

¹⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0757&from=EN>

¹⁹ <https://filagri.be/wp-content/uploads/sites/2/2020/04/Dépenses-alimentaires-Perspectives-1960-2020-Analyse-IDD-avril-2020-Déf.pdf>

As an example, in 2018, Unilever, the multinational Dutch Fast-Moving-Consumable Goods (FMCG) company, acquired the Dutch start-up 'The Vegetarian Butcher' for an undisclosed amount (Unilever, 2018)²⁰. In 2020, the Vegetarian Butcher accounted for less than 5% of Unilever's total revenue (Geijier & Gammoudy, 2020).

B.2.2.3 Role of retailers

Major retailers such as Carrefour, Colruyt, Delhaize, Lidl, Aldi have also entered the market for PBMS, and are present under their private labels (Deloitte, 2019; European Commission, 2018; Geijier & Gammoudy, 2020). For instance, Carrefour, Colruyt and Delhaize offer plant-based nuggets under their own brand (See Appendix 12). Several reports consider it as a market driver as retailers may promote plant-based alternatives on the same shelves as traditional meat and dairy products, leading to an increased visibility, recognition and acceptance of PBMS (Deloitte, 2019; European Commission, 2018).

B.2.2.4 Level of competition

The M&As, as well as the increasing presence of retailers are the signs of an increasing level of competition in the market for PBMS. In fact, according to Geijier & Gammoudy (2020), as the market is growing, different types of actors 'want a part of the plant-based pie'.

Decline in established categories of meat products presents a risk of being left behind for traditional companies of the food industry that remain static (Deloitte, 2019). As a result, many food and beverage companies are reacting to protect and potentially enhance their positions in the market. For instance, Cargill, one of the main global meat producers, has invested a lot in R&D for PBMS (AgFunder, 2021)²¹.

B.2.3 Social factors

Social factors cover the social environment and identify emerging social trends (Oxford, n.d). Three social trends will be presented in this section: the meat consumption, the growing social concerns as an explanation for the flexitarian trend, and the clean label trend. These social trends are expected to have an impact on the market for PBMS.

²⁰ <https://www.unilever.com/news/press-releases/2018/unilever-acquires-the-vegetarian-butcher.html>

²¹ <https://www.agriculture.com/cargill-ceo-says-plant-based-will-cannibalize-protein-business>

B.2.3.1 Meat consumption

Due to an increase in global population and rapid economic development, the last two decades have experienced a 58% growth in the global demand for meat (Whitnall & Pitts, 2019). It is predicted that the global market for meat will grow by 15% by 2027 (FAO, 2018).²²

Western diets are characterised by a high intake of animal-based products that is above dietary recommendations (Westhoek et al., 2014; World Resources Institute, 2016²³). According to the European Commission (2018b), consumption of animal proteins has reached very high levels in the EU but have tended to stabilise or even decrease in the last decade. On the other hand, plant protein intake is much lower and stable over the period (European Commission, 2018b).

In Belgium, the meat consumption is decreasing (Statbel, n.d.a)²⁴, even though the population is increasing (Statbel, n.d.b)²⁵. As a consequence, it can be assumed that the demand for plant-based protein sources is increasing in Belgium, which could benefit the market for PBMS.

B.2.3.2 The flexitarian trend

Beverland (2014) considered the shift from a meat-based diet to a plant-based diet as a change from one socio-technical system to another. According to Derbyshire (2017), consumers can now be grouped into three categories: meat consumers, meat avoiders, or meat reducers.

Several sources provide clear definitions of the diets chosen by consumers:

- **Omnivores** eat both plant and animal matter everyday (Cambridge, n.d). They are also defined as the ones who do not follow any limitation concerning the consumption of meat and fish (Clicer et al., 2018).
- **Flexitarians** or semi-vegetarians eat vegetarian food and meat and fish 3-4 times per week maximum (Cambridge, n.d ; De Backer & Hudders, 2014) For Clicer et al. (2018), flexitarians will consciously consume a limited quantity of either all types or specific types of meat;
- **Vegetarians** do not eat meat nor fish (Cambridge, n.d ²⁶ ; Clicer et al., 2018; De Backer & Hudders, 2014);

²² http://www.fao.org/3/i9166e/i9166e_Chapter6_Meat.pdf

²³ <https://www.wri.org/publication/shifting-diets>

²⁴ <https://statbel.fgov.be/fr/themes/agriculture-peche/bilans-dapprovisionnement#panel-12>

²⁵ <https://statbel.fgov.be/fr/themes/population/structure-de-la-population>

²⁶ <https://dictionary.cambridge.org/fr/>

- **Vegans** do not eat or use any animal products, such as meat, fish, eggs, cheese, or leather (Cambridge, n.d).

In the past, plant-based alternatives were consumed by the relatively small number of vegetarians and vegans (Deloitte, 2019). However, in the past decade, the flexitarians have become interested in these products (Geijer & Gammoudy, 2020). In fact, according to other studies, the growth of the market for plant-based alternatives has been largely driven by the emergence of flexitarian (Deloitte, 2019; Agrosynergie, 2018). The European Commission (2018) even considers that around 90% of plant-based alternatives are consumed by flexitarians.

According to iVox (2020), the number of flexitarians is growing in Belgium. In fact, a survey done on 2000 Belgian show that the proportion of flexitarians went from 9% of the population in 2018 to 11% in 2020 (iVox, 2020). This growing social trend could then benefit the market for PBMS in Belgium.

B.2.3.3 Growing social concerns

According to Derbyshire (2017), vegans, vegetarians and flexitarians act upon a combination of social concerns and values about their environment, their health, and animal welfare. These concerns can then be considered as an explanation for the growing number of flexitarians.

Ethical concerns

Lusk & Norwood (2009) found that animal rights and welfare campaigns highlighting ‘the cruelty and practices of factory farming’ are seen as a main factor for the increase in the number of vegetarians and flexitarians, especially among younger consumers.

The results of a study in Belgium by De Backer & Hudders (2014) showed that the more one is concerned about animals, the more likely one is to be a full time vegetarian, or reduce its meat consumption.

Health concerns

According to Richi et al. (2015), long-term consumption of increasing amounts of red meat and processed meat may increase the risk of mortality and of several diseases such as: cardiovascular disease, type 2 diabetes, and certain forms of cancer such as colon cancer. Cutting back on meat can therefore be considered as an important aspect of a healthy diet (Allen et al., 2000). Along with the

goal of achieving a healthy lifestyle, health motives include the desire to lose weight by reducing meat intake (Forestell et al. 2012).

Health has been identified as a central motive given by vegetarians or flexitarians for reducing or ceasing their meat intakes (Forestell et al. 2012; Ruby 2012). Furthermore, according to Fox & Ward (2008), health is the main reason driving greater acceptance of vegetarian diets among omnivores. The results of a study in Belgium by De Backer & Hudders (2014) showed that the more one is concerned about his or her health, the more one is likely to belong to the flexitarian group. This fact is in line with other studies finding that health motives are of particular importance among flexitarians (Fox and Ward 2008; Forestell et al. 2012).

Environmental concerns

According to Assadourian (2010), the western society is currently experiencing a shift from consumerism to sustainability considerations. Food choices, eating habits, and food-consumption patterns are one of the causes of environmental issues by affecting biodiversity, climate change and the use of oil, water, and land (Dagevos & Voordouw, 2013). More specifically, Dagevos & Voordouw (2013) have found that conventional meat products were among the most energy-intensive and ecologically burdensome food products.

As a consequence, some consumers are looking for eco-friendly food products or are considering a shift towards vegetarian or flexitarian diets as a solution (He et al., 2020; Kyriakopoulou et al., 2019). Indeed, two studies showed that the more one is concerned about the environment, the more one is likely to reduce meat consumption, and shift to a flexitarian diet (Beverland, 2014 ; De Backer & Hudders, 2014).

B.2.3.4 Clean label trend

According to Curt Albright (in Kateman, 2021), consumers have growing concerns on the food supply chain, thus demanding more transparency. Transparency is requested by consumers through specific food labels on: animal welfare, country of origin, carbon footprint, health benefits, composition and nutritional value, and production method (Kyriakopoulou et al., 2019). Indeed, label information seems to positively influence consumers' willingness to pay for desired attributes or products (Santeramo et al. 2018). For example, a consumer trend for local products emerged in Western countries (Lazzarini et

al., 2017). According to Grunert (2006), consumers will be more and more influenced by the origin modifying their preferences towards local products.

B.2.4 Technological factors

Technological factors cover ‘the rate of technological innovation and development affecting a market or an industry’ (Oxford, n.d). They include technological activities, infrastructures, changes and incentives (Ho, 2014).

B.2.4.1 Level of innovation

Final attributes of PBMS will be influenced by the existing level of innovation used in the manufacturing process (Slade, 2018). Moreover, these attributes will influence consumers’ perceptions and willingness to buy the products (Slade, 2018).

According to Kyriakopoulou et al. (2019), the development of acceptable texture and flavour is often the biggest challenge for companies developing PBMS. However, there has been significant investment and innovation in the technology for PBMS, in an attempt to replicate the texture and taste of meat (Deloitte, 2019). Thanks to R&D, it is now possible to achieve a meat-like structure by combining plant-based ingredients and a robust technology such as extrusion, shearing and spinning (Kyriakopoulou et al., 2019). Moreover, Carsten et al. (2018) consider that the current technology is easy to produce at scale.

In addition, the existing food technology allows PBMS to have an almost similar nutritional value to meat (Van Mierlo et al., 2017). Indeed, according to Van Mierlo et al. (2017), most of the important nutrients of meat can also be found in their currently available PBMS.

According to Deloitte (2019) food technology has been developed over the years to satisfy consumer needs and expectations for PBMS, which shows that the existing level of technology can be considered as a market driver. However, Kateman (2021) considers that tasty and healthy recipes of PBMS still cost a lot of money in terms of product development and R&D.

B.2.4.2 Future potential of the technology

According to Kyriakopoulou et al. (2019), open source R&D on the production of PBMS is needed to drive the market. In fact, certain meat-products do not have their plant-based counterparts yet due to

a lack of advanced technology (Geijer & Gammoudy, 2020).

Moreover, future technology could be a market driver by cutting the costs. Ashley Hartman, senior principal of Bluestein Ventures, says getting PBMS prices down will require investments across the supply chain, from ingredients to product development, using the right technology and manufacturing processes (Kateman, 2021).

B.2.4.3 Emergence of cultured meat and insect-based meat

Two other types of products are emerging to offer substitutes to animal-based meat products: insects-based and cultured meats (He et al., 2020). The technology behind is considered as promising for the food industry (He et al., 2020). In fact, Carsten et al. (2018) consider that cultured meat could account for the biggest share in meat consumption in the future (See Appendix 9). It raises some questions on whether cultured meat should be considered a threat or as a driver for the market of PBMS.

After having reviewed technological factors, it seems that the existing level of technology acts as a market driver even though R&D is still needed to cut costs and enhance product development.

B.2.5 Environmental factors

Environmental factors cover the influence of the surrounding environment and the impact of ecological aspects (Oxford, n.d).

B.2.5.1 Environment impact of livestock farming

The United Nations and more specifically the Food and Agriculture Organization (FAO) (2006)²⁷ estimated that livestock, and therefore meat production, was responsible for 18 percent of greenhouse gas emissions, which is more than any other human enterprise except for the energy sector. Moreover, meat production requires a lot of water and land, to produce feed for livestock and to grow animals (Clément, 2019; FAO, 2006; World Resources Institute, 2016) (See Appendix 13).

As a consequence, several ecological studies have identified the reduction of animal-based protein consumption as one of the most important and necessary sustainable actions (Carlsson-Kanyama &

²⁷ <http://www.fao.org/3/a0701e/a0701e.pdf>

Gonzalez, 2009; Carrington, 2018b²⁸; Salonen & Helne, 2012).

As PBMS requires less water and land, and emits less GHG (See Appendix 14) (The Economist, n.d)²⁹, it seems that they could offer a solution to the negative impact of meat on the environment.

B.2.5.2 Availability of protein-rich plants in Europe

A study by European Commission (2018b) highlighted the fact that the type of PRPs produced in each European country will depend on the country's climate. A map of EU countries showing the different PRPS produced in Europe is provided in Appendix 15. Northern countries, including Belgium, mainly produce rapeseed, field peas and field beans, considered as crops more adapted to cold climates (European Commission, 2018b). As a result, the European Commission (2018b) warns about a potential risk that represents climate change for the production of PRPs in Europe, and therefore on the market for PBMS.

To conclude this section on the external environment, it can be pointed out that several external factors appear to be potential market driver or barrier to the development of this new market. As a reminder, we were able to classify the previous examples into market drivers or barriers and the overview of the PESTEL analysis can be found in Appendix 10.

²⁸ <https://www.theguardian.com/environment/2018/oct/10/huge-reduction-in-meat-eating-essential-to-avoid-climate-breakdown>

²⁹ <https://www.economist.com/international/2019/10/12/plant-based-meat-could-create-a-radically-different-food-chain>

B.3 Market segmentation and consumer decision-making process

This section will present a possible segmentation of the market for plant-based meat substitutes, as well as a decision-making process leading to the purchase of PBMS by consumers.

B.3.1 Market segmentation

As seen in section B.2.3.2, it is possible to segment the market for PBMS according to consumer diet and to the meat consumption.

Deloitte (2019) considers that until 5 years ago, plant-based alternatives were mainly consumed by the relatively small group of vegetarians and vegans, making it a niche market. According to De Boer et al. (2017), vegetarians and vegans are not the target group of the new generation of PBMS as they want their meals to be as natural as possible, and therefore avoid any processed food. In fact, several studies consider flexitarians as the main target group of these products (Agrosynergie, 2018; Deloitte, 2019; Proveg, 2020b). Younger consumers appear to be also at the forefront of this shift in diets (Geijier & Gammoudy, 2020).

An online survey was conducted by the research bureau iVOX in 2020 among 2000 Belgians representative. It shows that omnivores still account for the largest part of the population in Belgium with 71,6% in 2020, whereas flexitarians represent 11% of the Belgian population (See Appendix 16). The proportion of flexitarians increased to 15,2% for people below 34 years old and 19% for people living in Brussels, showing that young people living in urban areas are more likely to become flexitarian (iVox, 2020). Moreover, 13% of the women are flexitarian, and 8% of the men are flexitarian (iVox, 2020). Finally, the proportion of flexitarian is higher in the group of people having received higher education (iVox, 2020). It seems that the current target of PBMS is educated young people living in urban areas.

The purpose of the next section will be to present a consumer decision-making process, from consumer values and motivations, to perceptions and attitudes, in order to present the process leading to omnivores' attitude towards PBMS.

B.3.2 Consumer decision-making process

B.3.2.1 Overview of the process

According to Grunert & van Trijp (2014), the consumer decision-making process is a function of three consecutive components: ‘want formation’, ‘inference formation’, and lastly ‘formation of trial and repeat purchases’ (See Appendix 17).

1° ‘Want formation’ is a function of both personal factors, i.e values, and situational factors, i.e goals and motives. It deals with which benefits a consumer would like to obtain from a product at any moment in time (Grunert & van Trijp, 2014).

2° ‘Inference formation’ deals with how the consumer will perceive the attributes of a product and which benefits these attributes are believed to bring about to the consumer (Grunert & van Trijp, 2014).

The two latter points are in line with the approach developed by Hoek et al. (2011) and He et al. (2020). Both papers consider that two types of factors can influence consumers’ perceptions of PBMS: person-related and product-related factors. Person-related factors are individual food preferences and motives, and are related to the first step ‘want formation’. Product-related factors are attitudes and beliefs towards the product itself, and are related to the second step ‘inference formation’.

3° Finally, ‘formation of trial and repeat intentions’ deals with the intention to purchase the product and the intention to keep buying it (Grunert & van Trijp, 2014). The trial and repeat intentions are also considered respectively as the consequences of a positive attitude towards and a high level of acceptance of the product (Eagly & Chaiken, 1993 in Eagly & Chaiken, 2007).

B.3.2.2 ‘Want formation’ - person-related factors

B.3.2.2.1 Personal factors: Values & Food consumption

Personal factors are related to the consumers’ values (Grunert & van Trijp, 2014). Schwartz (2012) defined human values as “concepts or beliefs about desirable end states or behaviours that transcend specific situations, guide the selection or evaluation of behaviour and events, and are ordered by

relative importance". Values can be used to understand omnivores' desired benefits as they represent the 'ultimate human motivators with regard to a range of behaviours' (Grunert & van Trijp, 2014).

Based on the findings of the literature, links between meat consumption and values will be presented, by following the 10 values of the Value Model developed by Schwartz (2012) (See Appendix 18).

Hedonism values derive from 'organismic needs and the pleasure associated with satisfying them' (Schwartz, 2012). According to Kitsawad & Guinard (2014), pleasure is related to the consequences of eating enjoyment. Hedonistic consumers will strive for pleasure and enjoyment of life and sensory appeal of food would tend to play a major role in their decision-making process (Kitsawad & Guinard, 2014). Omnivores were found to put great emphasis on meat's taste which brings them pleasure (Lea & Worsley, 2003).

Achievement values 'emphasize demonstrating competence in terms of prevailing cultural standards, thereby obtaining social approval' (Schwartz, 2012).

Universalism values derive from 'survival needs of individuals and groups' (Schwartz, 2012). According to Schwartz (2012), people have to become aware of the scarcity of natural resources to recognise this need. Universalism is a function of two subtypes of concern—for the welfare of those in the larger society and for the welfare of nature (Schwartz, 2012).

It has been found that consumers holding universalism values might have environmental concerns, and therefore opt for a food consumption that is more sustainable and less conventional (De Boer et al., 2007). A study done by De Boer et al. (2013) showed that universalism was associated with a diet being low on meat correlated with an animal friendly attitude and behaviour and a purchase of 'free-range' meat. These findings are in line with the study of Allen et al. (2000) who found that consumers tending towards vegetarianism value equity, peace and social justice.

Benevolence emphasizes 'voluntary concern for others' welfare' (Schwartz, 2012). According to Clicerì et al. (2018), empathetic consumers appear to reduce their meat intakes as they have an ability to adopt the point of view of 'others' and therefore have an increased consciousness of emotions and mental state experienced by animals. Moreover, holding altruistic values is pointed out by Ruby (2012) as a positive predictor of vegetarianism.

In addition, it has been found that empathy scores were higher for vegetarians, followed by flexitarians and then omnivores (Cliceri et al., 2018). In fact, according to several studies, omnivores tend to deny the similarity between humans and animals in terms of emotions and mental capacities while vegetarians tend to recognize that humans and food animals might have similar emotions and mental capacities (Bilewicz et al., 2011; Cliceri et al., 2018).

Security values derive from basic individual and group requirements', and serve individual or group interests (Schwartz, 2012). Security was found to be related to sensory aspects in the sense of 'maintaining good family relationships and traditional ways of cooking' with appropriate food products (Kitsawad & Guinard, 2014). It appears that consumers embracing the value of security will avoid unfamiliar products (Kitsawad & Guinard, 2014). They also take care of their health (Schwartz, 2012).

According to a study, omnivores seem to be less interested in their health than other consumers (Cliceri et al., 2018). However, one of omnivores' pro-meat justifications is health (Cliceri et al., 2018). In fact, Apostolidis & McLeay (2016) found that both omnivores and flexitarians valued their health.

Power values emphasize 'the attainment or preservation of a dominant position within the more general social system' (Schwartz, 2012). Power values can also be interpreted as the transformation of individual needs into dominance and control (Schwartz, 2012). According to the study of Allen et al. (2000), omnivores place more emphasis on social power, rationality, reputation and self-control than vegetarians.

Stimulation values means searching for 'excitement, novelty, and challenge in life'. (Schwartz, 2012). Stimulation values are negatively correlated to the consumers' level of food neophobia, which can be defined as the 'overwhelming fear of new or unfamiliar foods' (Newbridge House, 2019). Regarding new food consumption, omnivores were found to be more food neophobic than flexitarians (Hoek et al., 2011). On the contrary, consumers tending towards vegetarianism were found to value excitement for novelty (Allen et al., 2000).

Self-direction values hold for having 'independent thought and action - choosing, creating, exploring actions' (Schwartz, 2012). Stimulation and self-direction values are both linked to openness to change, anxiety free values, self-expansion and growth (Schwartz, 2012).

Tradition values hold ‘for respect, commitment, and acceptance of the customs and ideas that one's culture or religion provides’ (Schwartz, 2012). According to Rothberger (2014), meat consumption is a philosophical choice, tied to consumers’ sense of identity and their traditional values. Eating meat is part of omnivores’ meal practices & traditions (Beverland, 2014). As Marshall (in Beverland, 2014) stated, the ‘way we do meals is constrained by what we recognize as a meal’. For instance, a ‘proper meal’ for British omnivores consists of a meat with plants (e.g. vegetables, grains) playing a supporting role (Marshall in Beverland, 2014). Ruby’s (2012) review on the motives to eat meat identifies ‘humans are meant to eat meat’ as one of the main motives. This traditional point of view is reinforced by omnivores’ belief that hunting animals was one of the main parts of human development and history, therefore being part of humans’ ancestral traditions (Beverland, 2014). These findings are in line with the study of Ruby (2012) which found that holding traditional values was considered as a negative predictor of vegetarianism, and therefore a positive predictor of omnivorism.

Conformity values derive from the requirement to avoid actions that might ‘disrupt and undermine smooth interaction and group functioning’ (Schwartz, 2012). Traditional and conformity values share the goal of ‘subordinating the self to socially imposed expectations’ (Schwartz, 2012), and are both conservative, anxiety based and self-protective values (Schwartz, 2012).

Two sets of dimensions

According to Schwartz (2012), the 10 values can be sorted into two sets of dimensions: conservation vs openness to change, and social vs personal-oriented values (See Appendix 18).

The ‘*Conservation vs Openness to change*’ relation reflects the conflict between values that emphasize ‘order, self-restriction, preservation of the past, and resistance to change’ (security, conformity, tradition) and values that emphasize ‘independence of thought, action, and feelings and readiness for change’ (self-direction, stimulation) (Schwartz, 2012). For instance, pursuing novelty and change-stimulation values is likely to undermine preserving norms and customs (Schwartz, 2012).

The ‘*Personal vs Social values*’ dimension contrasts two sets of values: ‘self-enhancement’ and ‘self-transcendence’, respectively capturing the conflict between values that emphasize pursuit of one's own

interests and dominance over others (power, achievement, hedonism) and values emphasizing ‘concern for the welfare and interests of others’ (universalism, benevolence).

According to their diets, omnivores seem to hold more conservative and traditional values whereas flexitarians and vegetarians seem to be more open to novelty adopting a more liberal view. In the second dimension, omnivores seem to hold personal values (social power, hedonism), whereas flexitarians and vegetarians would value interests of animals and the environment.

Values provide the ‘*enduring motivational aspects*’ of consumer wants (Grunert & van Trijp, 2014). However, to explain consumer choice, they will have to be supplemented by other factors such as the *situational factors* (Grunert & van Trijp, 2014).

B.3.2.2.2 Situational factors: Desired benefits

Goals have a higher degree of specificity than values, and they have a situational component which make them essential to consider as consumers can have different goals in regards to a specific situation (Grunert & van Trijp, 2014).

Goals that consumers want to get out of a situation point at desired benefits that they want to get out of the product to be bought (Grunert & van Trijp, 2014). It has been suggested that these desired benefits can be classified as ‘to whether they deliver benefit to the self or to others’, and whether ‘they deliver direct gratification or delayed gratification’ (Grunert & van Trijp, 2014). Grunert & van Trijp (2014) have listed some of the main types of benefits sought by consumers.

	Self-directed	Other-directed
Direct gratification	sensory aspects, price, convenience	animal welfare, local production
Delayed gratification	health, weight	sustainability

If we follow the logic of Grunert & van Trijp (2014), it could be interesting to present some of the omnivores’ motivations, i.e. goals, for reducing their meat consumption as they could influence their desired benefits.

Omnivores' motivations for reducing meat consumption

According to the study by Mulee et al. (2017) done in Belgium, omnivores' most common motives to adopting a vegetarian diet are first their health, followed by the discovery of new tastes, and the willingness to control their weight.

The Lentz et al. (2018) study of New Zealand consumers suggested that the price of conventional meat along with health concerns were the two primary motivations for omnivores to progressively reduce their meat consumption. Several authors also found in their studies that omnivores identified health as the strongest benefit associated with a reduction of meat consumption (Lea and Worsley, 2003; Lentz et al. 2018; Penny et al., 2015).

Differences in motivations and concerns between flexitarians & omnivores

The studies of Hoffman et al. (2013), Lentz et al. (2018), and Mulee et al. (2017) found that ethical concerns (e.g. environment and animal welfare) were less present for omnivores than flexitarians, which could explain their differences in terms of meat consumption. Moreover, flexitarians and omnivores were found to differ in their taste for variety, as flexitarians seem to have more 'adventurous palates' (Slide, 2018).

Barriers to meat reduction

Several studies have shown that a strong taste preference for meat is a barrier to meat reduction (Barr & Chapman, 2002; Corrin & Papadopoulos, 2017; Lea & Worsley, 2003; Mulee et al., 2017). Other barriers found in the literature were the unwillingness to make dietary changes, the lack of cooking skills, and the lack of interest (Corrin & Papadopoulos, 2017; Mulee et al., 2017). From these results, it can be assumed that omnivores' desired benefits are linked to taste, habits, and convenience.

As a conclusion to the 'want formation' part, it can be pointed out that omnivores who may have motivations to reducing their meat consumption will still have desired benefits that are all self-directed. The desired benefits of an omnivore seem to be linked to taste, habits and convenience.

B.3.2.3 'Inference formation': Product-related perceptions

In the second step of the decision-making process of (Grunert & van Trijp, 2014), consumers will form inferences based on their product perceptions. These perceptions are also known as product-related perceptions (Hoek et al., 2011), and are influenced by three aspects: technology features (e.g. the colour), product features (e.g. the composition), and marketing features (e.g. the positioning) (Grunert & van Trijp, 2014). Consumers will either perceive product attributes positively, and they infer a product benefit, or negatively, and they infer a product barrier (Grunert & van Trijp, 2014).

As only a few studies exist on the perceptions of PBMS, the purpose of this section is to offer a theoretical framework to use during the qualitative study.

Consumers' perceptions of PBMS should be analysed around several product-related factors: sensorial aspects and familiarity, naturalness, convenience, environmental and social impact, health aspects, price, and diversity. These factors were reviewed from a study on innovation-related perceptions (Albertsen et al., 2020), and can be used for this section due to the innovative character of PBMS.

Convenience, or effort refers to the 'ease, or access with which a food can be prepared and consumed' (Albertsen et al., 2020). According to Michel et al. (2021), certain PBMS are perceived by omnivores and flexitarians as relatively easy to prepare. On the contrary, some participants in the Elzerman et al. (2013) study reported that cooking an 'equally delicious' meal with PBMS instead of conventional meat would take more time.

Health aspects 'are likely to play an important role in the larger acceptance and adoption of plant-based meat alternatives.' (Hoek et al., 2011). A study shows that PBMS were perceived as healthier than its meat counterparts (Hoek et al., 2011). Moreover, according to the study done on vegetarian nuggets and sausages in comparison to chicken nuggets and wiener sausages, it has been shown that the PBMS were perceived by omnivores and flexitarians as healthier, richer in proteins, and lower in fat content than their counterparts (Michel et al., 2021). Focus group discussions in the Netherlands by Elzerman et al. (2013) also revealed that the nutritional content and health aspects of PBMS is a perceived benefit of the product.

On the contrary, the Good Food Institute (2020) showed that PBMS were not always perceived as a healthy option, but rather as a positive step towards a healthier diet.

Naturalness seems to be an important predictor of consumers' perceptions of health aspects (Connor & Siegrist, 2010; Siegrist, 2008 in Albertsen et al., 2020). In the study done by Michel et al. (2021), all PBMS were perceived by flexitarians and omnivores as more artificial and therefore less natural than their meat-based counterparts.

Familiarity is the degree to which the consumer is feeling familiar with the product despite its innovative character (Albertsen et al., 2020). The level of perceived familiarity will depend on consumers' perceptions of the sensorial aspects (taste, smell, texture, appearance) (Hoek et al., 2011). As an example, Michel et al. (2021) found that all meat products were perceived by flexitarians and omnivores as tastier than PBMS.

Price. Elzerman et al. (2013) have found that many consumers were not choosing plant-based alternatives due to the belief that vegetarian products were more expensive. Michel et al. (2021) showed that two PBMS (plant-based nuggets and sausages) were perceived by omnivores and flexitarians as more expensive than their meat counterparts.

Environmental and ethical friendliness received high scores by omnivores and flexitarians in a study done by Hoek et al. (2011). Moreover, according to the study of Michel et al. (2021), it has been shown that PBMS were perceived as more environmentally friendly than their meat-based counterparts.

Diversity of the range of PBMS was perceived as low by consumers according to (Deloitte, 2019). The same report points out that consumers especially perceived a lack of exciting flavours.

It appears that omnivores have different perceptions of the different attributes of PBMS, leading them to infer product benefits and/or barriers. After having reviewed omnivores' values, motivations and perceptions, it is now possible to move to step 3 to present their intentions to try and buy PBMS.

B.3.2.4 Formation of trial and repeat intentions

Attitude

The last step of the consumer decision-making process of Grunert & van Trijp (2014) is the formation of trial and repeat intentions. The consumer's intention for a 'trial purchase' is the consequence of a positive attitude which is defined as the 'psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor' (Eagly & Chaiken, 1993 in Eagly & Chaiken, 2007). In other words, consumers will express a positive or negative judgement as to the value of something (Bagozzi et al., 2002), and a positive judgment could lead to an intention to try.

Consumers' intention for a trial and repeat purchases is related to the extent to which the product benefits that they infer from a product based on their product-related perceptions, will match their desired benefits (Grunert & van Trijp, 2014). It is the result of a potential fit between the first step on 'want formation' and the second one on 'inference formation' of the model of Grunert & van Trijp (2014).

As an example, according to Hoek et al. (2011), omnivores may lack strong ethical value orientation and ethical motives, and may at the same time perceive PBMS as more ethical than meat, and infer that it is a product benefit. This study considers this mismatch as the reason why omnivores do not regularly consume these types of products.

Moreover, taste and price seem to not always be the two main desired benefits driving the trial and purchase intentions of PBMS. In fact, according to a study carried out by Slade (2018), if both the taste and price of meat and PBMS were equivalent, approximately 65% of consumers would continue to buy conventional meat products, whereas 21% would consider PBMS.

Furthermore, Hoek et al. (2011) considers that one of the most important factors in the acceptance level of PBMS is the familiarity with the product. In fact, a perceived unfamiliarity with PBMS will result in a lower adoption of these products (Hoek et al., 2011).

Trial intentions

According to Grunert & van Trijp (2014), once consumers have a positive attitude towards a product, they will be ready to try it. In regards to PBMS, it has been found that omnivores would prefer to try certain types of products, and in certain situations.

According to Michel et al. (2021) a promising approach is to replace processed meat products such as sausages or chicken nuggets with a plant-based version. In fact, they have found that a breadcrumb coating, a sauce or spices were responsible for a positive eating experience with these products. Moreover, in Michel et al. (2021) study, both flexitarians and omnivores indicated a preference for a PBMS to look like meat, which is in line with findings of Hoek et al. (2011).

In addition, several studies showed that the situations in which meat substitutes are consumed have an impact on the degree of acceptance of these products (Cardello & Schutz, 1996; Meiselman et al., 2000; Michel et al., 2021). PBMS are more accepted in casual situations and less appropriate in formal situations when social pressure is likely to be present (Michel et al., 2021). Eating alone has the highest acceptance ranking according to Michel et al. (2021). Finally, Funk et al. (2020) pointed out that role modelling and the social environment could also help overcome a reluctance to try, for example, when hosts serve a vegetarian meal with PBMS to their guests.

Repeat intentions

Grunert & van Trijp (2014) consider that the first experience with a product will have an important influence on whether the consumer wants to buy the product again. More specifically, the sensory experience with the product, together with convenience, are considered as the decisive factors for whether a trial of a product turns into a repeat purchase (Grunert & van Trijp, 2014). However, intangible benefits such as health aspects, sustainability, level of naturalness, and authenticity may also influence intentions to repurchase the products (Grunert & van Trijp, 2014).

Based on the literature, we were able to illustrate the consumer decision-making process developed by Grunert & van Trijp (2014) by considering omnivores as the consumers and PBMS as the products.

B.4 Marketing strategies

As seen in section B.1.6, the market for plant-based meat substitutes (PBMS) is still at an early stage, which is illustrated by a low market share compared to conventional meat-products. However, the market seems to be promising in terms of growth.

This section will focus on the business strategies as presented by Gailly (2020) in its strategy framework (See Appendix 1) including both corporate and business strategy. Business strategy addresses ‘how the company should compete’, while corporate strategy is concerned with the ‘businesses in which the company should compete’ (Gailly, 2020).

Our focus will be to review the literature on these business strategies, by focusing on specific companies active in the market for PBMS. As seen in section B.2.2.4, different types of companies are active in the market for PBMS: retailers, traditional food companies, private label producers, FMCG multinationals, and scale-ups and start-ups having PBMS in their product-portfolio.

Several marketing strategies have been identified in the literature. The latter will be reviewed by following the 4Ps (Price, Place, Product, Promotion) of the marketing mix (Baker, 2014). A specific review of product development strategies will also be provided.

B.4.1 Marketing Mix

According to Baker (2014), there are two main decisions that are central to marketing strategies: first, the targeting, which determines where the company will compete and then the design of the marketing mix (Product, Price, Promotion and Place or Distribution methods), which determines the success of the company in these markets.

B.4.1.1 Price

According to Baker (2014), price calls for a high level of attention as it is of critical importance in the consumer buying decision. This part of the marketing mix refers to the different pricing strategies that exist, for instance a psychological or penetration pricing (Singh, 2012). A penetration pricing strategy consists of fixing the price of the product comparatively low to similar goods assuming that it will capture a wide market (Singh, 2012).

A study from Geijer & Gammoudy (2020) has shown that PBMS were still more expensive than conventional meat products in Europe (See Appendix 19). Animal-based products are currently cheaper to produce than plant-based alternatives, as traditional meat companies can benefit from economies of scale and government subsidies (Kateman, 2021).

Several authors consider that to stimulate the market for PBMS, it is essential to reduce their price and position them below prices of meat (Geijer & Gammoudy, 2020; Michel et al., 2021). This is in line with the study of Carsten et al. (2018), mentioning the fact that the main challenge for companies offering PBMS will be to scale up their production in order to be able to compete with animal-based companies on price.

According to Geijer & Gammoudy (2020), prices are expected to decrease from now until 2025. The same study considers that the decrease in price is due to three strategies: first, by lowering marketing expenses once consumers are becoming more familiar with PBMS. Second, economies of scale can be achieved via a consolidation of the market, i.e via mergers and acquisitions. Finally, economies of scale can be achieved by increasing the volumes that are produced, which is currently the case of the retailers with their own private label brands (Geijer & Gammoudy, 2020).

B.4.1.2 Place

Place is referred to as the distribution channels (Baker, 2014; Singh, 2012). It represents the process of transferring products from the producer to the consumer. According to Singh (2012), a place can be any physical stores as well as virtual stores, and the author has listed the different strategies in terms of distribution channels: retail, wholesale, internet, direct sales, peer to peer and multi-channel.

In regards to PBMS, a study considers that the main strategy for brands is to make their PBMS available in the largest retailers globally (Deloitte, 2019). It is for instance the strategy of Beyond Meat with a recent large expansion all over European retailers (Albrecht, 2021).

B.4.1.3 Promotion

Baker (2014) considers that awareness is a necessary prerequisite to purchase, and that promotion is often regarded as a 'cost-adding function adding nothing or a little to the value of a product', which is

not his point of view. According to Baker (2014), an effective promotion strategy will be composed of both personal and impersonal communication channels, which is called an IMC - Integrated Marketing Communications. Furthermore, Singh (2012) pointed out that promotion activities are meant to persuade 'the target market to buy the company's products.' Several strategies were identified in Singh' (2012) study: discounts, role model endorsements, advertising, user trials, posters, direct mailing.

According to He. et al. (2020), improving consumers' acceptance of PBMS is the most important matter to mainstream the purchase of such products, and increase the market share. The same study considers that raising consumer awareness with targeted communication is one of the best ways to improve consumers' acceptance. Peschel et al. (2019) considers that brand should opt to promote their PBMS as environmentally friendly, ethical friendly or as healthy and having a good nutritional value.

B.4.1.4 Product

Baker (2014) defines a product as 'a combination of objective and subjective properties designed or intended to provide need-satisfying experiences to consumers'. Baker (2014) considers that all the companies should start by establishing the precise needs of the customer and the benefits they are looking for, prior to deciding what combination of products is needed in the product portfolio.

According to Baker (2014), different strategies are then possible, based on the companies' present products, and these strategies are linked to the well-established product-market expansion matrix developed by Ansoff in 1957 (Harvard Business Review, 2012). Ansoff (1957) listed four strategies:

- **Market penetration:** increasing sales of its present products in its present markets, through aggressive promotion and distribution (Baker, 2014).
- **Market development:** increasing sales by taking its present products into new markets (Baker, 2014), which could be a new geography or a new customer segment (Ansoff, 1957).
- **Product development:** increasing sales by developing new or improved products for present markets (Baker, 2014; Grunert & van Trijp, 2014), which is also known as a product differentiation approach (Baker, 2014).
- **Diversification:** increasing sales by developing new products for new markets, with no prior experience of either (Ansoff, 1957; Baker, 2014).

Different studies and reports consider that product development is an essential marketing strategy to drive the market for PBMS (Deloitte, 2019; He et al., 2020; Geijer & Gammoudy, 2020). According to Geijer & Gammoudy (2020), by launching new PBMS, companies could have a better product fit with consumer needs and therefore increase their sales.

The focus of the next section will be on the strategies of product development identified in the literature and aiming to further develop and drive the market for PBMS.

B.4.2 Product development strategies

B.4.2.1 New Product development Process

Product development can be defined as the transformation of a market opportunity into a product available for sale (Krishnan & Ulrich, 2001).

According to Trott (2008), the new product development process (NPD) consists of 5 stages:



B.4.2.2 Product Development & External factors

According to (Van Trijp and Steenkamp, 2005 in Grunert & van Trijp, 2014), the external environment of a market will influence the companies' need for product development strategies.

On the demand side, consumer needs are subject to change over time, as well as the ways in which they seek to satisfy these needs through the purchase and consumption of specific products (Grunert & van Trijp, 2014). As a consequence, Grunert et al. (2011) consider consumers' insights should be used to identify new market opportunities and that product development is a necessity when consumers' needs and expectations change. In fact, according to Grunert & van Trijp, 2014, product development may be the result of demographic, socio-economic, and cultural changes in society.

Regarding the market for PBMS, several social trends highlighted in section B.2. could then have an impact on the demand side product development strategies.

On the supply side, several external factors were pointed out by Grunert & van Trijp (2014), as drivers or barriers to product development:

- *Political and legal factors* through new requirements of food laws and regulations,
- *Economic factors*, for instance an increased or reduced purchasing power of consumers,
- *New food technology* providing new opportunities to both deliver new product related benefits to the consumer and deliver existing benefits more effectively and efficiently,
- And, the *competitive environment* changes, for instance when new products introduced by competitors can change consumers' perceptions of existing products in the market.

Regarding the market for PBMS, several trends highlighted in section B.2 could then have an impact on the supply side and therefore on product development.

B.4.2.3 Product Development & Consumer Insights

According to Grunert et al. (1997), the key factor of product development's success is the degree of fit between the new product features and consumer needs. The new product developed can then be considered as a mix of concrete attributes that the company offers as a 'vehicle for superior consumer benefit delivery' (Van Trijp & Steenkamp, 2005).

Grunert et al. (2011) stated that product development in the meat sector has to be supported by consumer insights and the level of technology acceptance by consumers of these new products, in order to avoid failure of product launch.

In fact, He et al. (2020) consider that breaking the identified barriers that prevent the acceptance of PBMS is an urgent task for the companies offering PBMS. In order to increase the sales of PBMS, perceived benefits to consume PBMS need to outweigh the perceived barriers (Hoek et al., 2011).

Moreover, the World Resources Institute (2016), has identified several approaches to make consumers shift diets, and therefore reduce their meat intakes. In fact, the strategy would have to make social

norms evolve, minimize disruption, sell a compelling benefit, and maximise awareness (See Appendix 20) (World Resources Institute, 2016). A product development strategy could be implemented to follow this framework in regards to the level of disruption and the compelling benefits that are offered.

B.4.2.4 Identified strategies of product development

Three different strategies of product development have been identified in the literature.

PMBS improvements of sensorial aspects

According to several studies, significantly improving the meat-like aspects of PBMS is imperative to increase the acceptance of these substitutes, and therefore tackle the consumers' negative perceptions linked to unfamiliarity with the product (He et al., 2020; Hoek et al., 2011; Michel et al., 2021). Improved versions of current PBMS are expected in the plant-based sector through the use of new production technologies, better formulation and a wider range of ingredients (Geijer & Gammoudy, 2020).

New PMBS covering all the categories of meat-products

In fact, certain products of the meat category do not have a substitute yet, especially for the high-end meat products (entrecote, duck, etc) (Geijer & Gammoudy, 2020). Certain products such as beef steak, pork, lamb not have a plant-based alternative yet (Geijer & Gammoudy, 2020).

New & healthier PMBS

Several studies consider that the nutritional quality of PBMS should be improved, and that new products should offer additional health benefits, for instance by including new protein-rich plants, algae, mushrooms, or insects (Geijer & Gammoudy, 2020; Hoek et al., 2011). Moreover, Hoek et al. (2011) pointed out that consumers consider that the ideal meat alternative should 'contain more protein, more vitamins, and fewer calories.' This strategy could be linked to the development of products offering compelling personal benefits as recommended by the WRI (2016).

Finally, even though product development is an activity that is both necessary in light of external trends and consumer need, it remains risky in terms of potential market failure (Grunert & van Trijp, 2014).

As a conclusion to this section on marketing strategies, it seems that companies active in the market for PBMS will implement strategies in regards to each one of the 4Ps of the marketing mix. However, a strong focus on product development strategies has been recommended by several studies.

B.5 Literature review - Conclusion

The literature review has established the contextual framework for our research.

First, it was necessary to provide a context of the market for plant-based meat substitutes (PBMS), in order to have an idea of its positioning, its progress and its potential. This presentation will make it easier to approach the qualitative phase by having a strong contextual framework.

Due to its recent nature, the market for PBMS is very little studied in the literature and only few studies demonstrate the impact that external environmental factors may have on this market. We were still able to gain a good understanding of the social trends, as a lot of studies already explored the trends towards a flexitarian diet. On the other, we were able to identify some external elements that could be considered as market drivers or barriers. As this area of research is still relatively unexplored, it will be subject to further investigation in our qualitative study.

Based on the literature, we were able to illustrate the consumer decision-making process developed by Grunert & van Trijp (2014) by considering omnivores as the consumers and PBMS as the products. This literature also provides a strong theoretical basis on the different types of diets chosen by consumers, as well as their motivations towards these diets. However, the literature is not complete on the consumer-decision making process of omnivore, and further qualitative study is needed to gain a better understanding of it. Exploring young omnivores' values, motivations and desired benefits regarding their food consumption, as well as their perceptions of PBMS would allow to better understand why they do not regularly consume this type of product.

Finally, we were able to present the different marketing strategies that exist around 4 distinct axes: price, distribution channels, promotion, and product. Some recommendations specific to the market for PBMS have been found in the literature. The literature will then be used as a contextual framework to further explore the main marketing strategies of companies offering PBMS, and investigate the importance of product development in them.

The next section presents the empirical part of our research, which involved two specific intensive qualitative studies.

C. QUALITATIVE STUDY

C.1 Analytical framework and methodology

The research objects, namely the impact of external factors on the PBMS market, omnivores' attitudes towards PBMS, as well as the marketing strategies implemented by the companies in the market for PBMS are still very little covered by the literature. This does not allow for a confirmatory approach, i.e. the development of hypotheses followed by a quantitative method to confirm the hypotheses.

This has led us naturally towards a qualitative approach, which allows us to explore in depth the different phenomena that matter to us. The tools used for the qualitative study were selected with rigor, according to the nature and objectives of our research.

In order to achieve data triangulation, several profiles were interviewed. Out of the 32 participants interviewed, 18 were *consumers* meeting the established criteria, 10 were *professionals* working in one of the companies offering PBMS in Belgium, and 4 were *experts* working in political or scientific organizations related to the sector. The different criteria of selection will be presented in the next section.

The analytical framework as well as the methodology will be presented in the following section.

C.1.1 Analytical framework of the qualitative study

C.1.1.1 Interviews with young omnivores

As presented in the literature review, PBMS are mainly consumed by flexitarians, which seem to be the current target group of companies offering PBMS. However, omnivores still constitute the largest share of the population in Belgium (See Appendix 16) and it is therefore interesting to focus our research on this consumer group to understand their attitudes towards PBMS.

In addition, as seen in the literature review, flexitarians are often young (<34 years old), educated and live in urban areas. We therefore chose to focus our qualitative study on young people who meet these criteria but are still omnivores, in order to isolate the influence of their diet.

Moreover, it was assumed that resistance to change our alimentation increases with age. We therefore believe it is interesting to interview young people who might be willing to adapt their diets in the future.

We have therefore chosen to interview consumers based on these criteria:

- **Age:** consumer being between 20 and 30 years old.
- **Education:** consumer having a high school diploma.
- **Location:** consumer living in an urban area in Belgium.
- **Diet:** consumer having an omnivore diet, thus consuming meat almost every day of the week, with a minimum of 5 days per week.
- **Level of PBMS adoption:** consumer who has never bought or does not regularly buy PBMS.

The level of PBMS is important as we wanted to focus our research on young omnivores who are not regular customers of PBMS in order to investigate the reasons of their negative attitudes.

C.1.1.2 Interviews with professionals & experts

As presented in the literature, more and more companies are active in the market for PBMS. A list of the different companies offering PBMS in Belgium, as well as major global brands of PBMS is respectively provided in Appendix 24 and 25. The first list covers all the brands of PBMS that can be found in the main Belgian national retailers: Carrefour, Delhaize, Colruyt, Lidl, Aldi.

These two lists have been created based on research on the internet and directly in the supermarkets. In terms of product portfolio, these companies all offer PBMS, but not always the same types of substitutes.

Several information can be highlighted:

- The key national retailers (Carrefour, Delhaize, Colruyt, Lidl, Aldi) offer plant-based meat substitutes under their own brands. The substitutes can be found on their supermarket shelves under their retailers' name (e.g. Carrefour Veggie burgers) or under another brand name (e.g. Boni Bio burgers developed by Colruyt).
- The large food companies active on the Belgian market are companies from France (Aoste), the Netherlands (Unilever) or Switzerland (Nestlé). They are known as 'Fast Moving Consumable Goods' (FMCG) companies, selling consumer packaged goods.

- Out of the 10 identified brands, 4 are Belgian companies, 3 are Dutch companies and the 3 last ones are respectively from the United States, France, and the United Kingdom.
- Private label producers were not included in this list.

We have therefore chosen to interview professionals based on these criteria:

- **Location:** professional working in a company selling PBMS via retailer(s) in Belgium.
- **Activity:** professional working in a company having PBMS in its product portfolio.
- **Experience:** professional with a minimum of 2 years of professional experience.
- **Positions:** professional being a marketing manager, a product development manager, a category (including PBMS) manager, a sales manager, or a founder.

We were also keen to have representatives from different types of companies as presented above, in order to have diversity in the answers and get different perspectives on the market for PBMS.

In parallel, we thought it would be interesting to also interview experts with more in-depth opinions on the various external factors that can impact companies in the PBMS market.

We have therefore chosen to interview experts based on these criteria:

- **Activity:** working for an association, a political or a scientific organisation active in Europe, and linked to the market for PBMS.
- **Experience:** professional with a minimum of 2 years of professional experience.
- Any positions.

C.1.2 Methodology

The methodology undertaken follows the following sequence: semi-structured interviews, followed by a qualitative analysis which is separated into three parts: data preparation, data analysis, and data interpretation.

C.1.2.1 Semi-structured interviews

We choose to conduct semi-directive interviews with each participant, i.e consumer, professional or expert. This interview format was specifically chosen in order to be able to have a structure to follow during the interviews, while allowing the person to express themselves freely.

Three different interview guides, i.e one for each type of interviewee, including the questions and themes to cover, have been used as a structure for all the interviews and can be found in Appendix 26, 27, and 28. All the definitions and explanations provided during the interviews can be found in the interview guides.

Consumers

Each interview lasted between 45 and 90 mins. The interviews with the young omnivores addressed the following themes.

Sections	Themes
Part 1	Consumer profile & diet; Purchasing criteria for food products; Motivations towards meat consumption.
Part 2	Experience with PBMS; Consumer Perceptions of PBMS
Part 3	Consumer Attitudes towards PBMS; Purchase intentions
Part 4	Values; Vegetarianism; Flexitarianism; Motives & Barriers towards meat reduction

As a reminder, the objective is to present the marketing strategies to adopt in order to increase the market shares of PBMS in the future. These interviews allowed us to meet the objective of the study by two means.

First, we were able to better understand their motivations and desired benefits when purchasing food products, as well as their perceptions of PBMS. The latter can be used to explain their negative attitudes towards these products, and to suggest a decision-making process highlighting their barriers to consuming PBMS, and what could be done to remove these barriers.

Moreover, we were able to determine to what extent young omnivores might be of interest to companies offering PBMS in Belgium.

Professionals

Each interview lasted between 30 and 45 mins. The interviews with the professionals addressed the following themes.

Sections	Themes
Part 1	Motivations, Value Proposition of PBMS, Growth
Part 2	External factors: Policies; Laws; Macro-environment; Social trends; Environment; Technology; Impact on the sector
Part 3	Target group; Future target
Part 4	Strategies: Price, Promotion, Place, Product; Product development

These interviews allowed us to meet the objectives of this study by two means.

In fact, due to their experience and position, the opinions of these professionals allowed us to better understand the external environment of this market and what are the external drivers and barriers impacting their growth and marketing strategies. We will then be able to highlight the opportunities in the external environment and to what extent it should be part of the companies' strategies to accelerate the market.

In addition, they provided us with valuable information on the marketing strategies implemented in the market, as well as on the importance of product development in their strategies.

Experts

Each interview lasted between 30 and 45 mins. The interviews with the experts addressed the following themes, and in this sequence:

Sections	Themes
Part 1	External factors: Policies; Laws; Macro-environment; Social trends; Environment; Technology; Impact on the sector
Part 2 (optional)	Product development (in case of technological background)

These interviews were conducted after the interviews with professionals, and allowed us to meet the objectives of this study by providing more in-depth opinions on the various external factors that can impact companies in the PBMS market. Moreover, the various impacts that were mentioned by the professionals were also deepened during the interviews with experts, which provided a better understanding of the influence of the external environment.

C.1.2.2 Qualitative analysis

The qualitative analysis is 'an activity of the human mind attempting to make sense of a world it wishes to understand and interpret, or even transform' (Paillé and Mucchielli, 2016 in Jolibert et al., 2012). Our qualitative study have an explanatory purpose, in order to prepare the work for a quantitative research and to provide qualitative insights with regards to several phenomena.

Our analysis is based on 3 steps:

1st step: *Data preparation*: transcription, and formatting.

2nd step: *Data analysis* by categorizing the units of analysis (words, sentences or themes) and by questioning the characteristics of the concepts and their reciprocal relations (hierarchy, association, contradiction). This analysis was accompanied by an effort at quantification.

3rd step: *Data interpretation* of the phenomenon studied via a theoretical loop and a contribution to the original research question.

C.1.2.2.1 Data preparation

The corpus of qualitative data is voluminous and complex. A preparation work was done before analyzing the interviews around two aspects: the transcription and the choice of the type of analysis.

Transcription

The qualitative data collected during the various interviews had to be processed before they could be analysed. Interviews were transcribed, i.e. put into writing, in order to constitute a global, accessible and comprehensive corpus. A *verbatim transcript* was done to capture every single word from the audio files. The transcriptions reflect exactly the same way those words were originally spoken.

Trint software³⁰ was used to carry out these transcripts. The 300 pages of transcripts are confidential and are not included in the Appendix available to the reader.

Choice of the type analysis: A mix between thematic & semantic content analysis

Different types of analysis were possible. According to Jolibert et al (2012), it can be lexical, i.e. on the word, semantic, i.e on the context of word production, such as the sentence or paragraph or thematic, i.e on the idea behind the speech.

The thematic approach, which generally corresponds to the grouping of several sentences considered to be close, is the unit most often used in marketing and gives rise to thematic content analyses (Jolibert et al., 2012). Thematic analysis has been adopted the most to analyse the data collected during the interviews. Some semantic and sometimes lexical analysis were still used to highlight the context or very specific answers.

C.1.2.2.2 Data analysis

Thematic content analysis is based on coding, which corresponds to the division of raw data into themes. The data can be classified, according to the meaning, into one or several categories, in order to achieve a clearer level of understanding of the raw data (Jolibert et al., 2012).

A category corresponds to '*a set of units of analysis with similar meanings, formal characteristics or properties*' (Allard-Poesi, 2003 in Jolibert et al., 2012).

As part of our coding, we have first identified and created specific categories, and then analysed these categories to make sense of the data, following the approach of Spiggle (1994 in Jolibert et al., 2012).

Categorisation

The categorisation stage consists of setting aside certain elements of the respondents' answers to the questions. These elements can then be classified and then grouped by analogy (Jolibert et al., 2012). According to the method of Jolibert et al. (2012), the categorisation provides a reduced view of the raw data

³⁰ <https://trint.com/>

In the context of our thematic content analysis, a grid was constructed, which summarises the themes, sub-themes and categories that allow for the analysis of all the raw data. NVIVO software was used to create these categories. A free version available for 2 weeks was used. We were able to get a short training via online videos, as well as some help from a university assistant from UCL Mons.

The coding grid can be developed deductively, when the analyst has identified, a priori, a list of concepts or inductively, when the analyst works through the coding, and that new categories emerge from the data (Jolibert et al., 2012). The deductive and inductive categorisations are also respectively known as theoretical and emergent categorisations (Jolibert et al., 2012).

We opted for a mix between a deductive categorisation that tried to follow the theory presented in the literature review, and an inductive categorisation that is enriched as the data was analyzed. It allowed new knowledge to emerge in relation to what had been presented in the literature review, which is essential to explore our research objects.

As an example, the interview guide for professionals did not include many questions on marketing strategies in relation to price, distribution channels and promotion. However, during the interviews these aspects were discussed at some length by the professionals, which resulted in the creation of specific categories and sub-categories for these aspects. This was also the case for the consumers who mentioned very specific expectations on the PBMS, and these expectations were therefore also the subject of categories and sub-categories in the coding grids.

The coding grid used for the interviews with young omnivores can be found in Appendix 29. We used only one coding grid for interviews with professionals and experts, as the categories and themes were overlapping on the external environment part of our research. This coding grid can be found in Appendix 30.

Our categories meet the essential criteria mentioned by Jolibert et al (2012). They are mutually exclusive, homogeneous, relevant, objective, and exhaustive.

Data Analysis

The data analysis was carried out using the coding grids created on NVIVO. Each theme, category and sub-category included statements collected from the various interviews we conducted. These statements are called verbatim (Jolibert et al, 2012).

On the basis of these verbatim groupings, a thematic content analysis was carried out in order to highlight the idea behind the speech in the final analysis.

Our data analyses followed the thread of the interviews by mentioning the most important aspects to answer our research questions, and to deepen them for future research. The most relevant verbatims were presented to illustrate our analysis and to allow the reader to better understand certain points. Indeed, it appeared during our analysis that some of the points mentioned could only be fully understood by reading a specific verbatim. Moreover, the verbatims are mentioned in their original language, i.e. French or English, in order not to distort the words.

Not all of the qualitative data collected during the interviews have been processed in the analysis.

In their qualitative studies, the authors Lapassouse-Madrid and Vlad (2016 in Jolibert et al., 2012) specify the frequencies of occurrence of the different themes identified in order to synthesize the information collected in a quantified way. We will also use this method of synthesizing the results.

C.1.2.2.3 Data interpretation

Data interpretation is the emergence of an insightful, holistic and synthetic understanding of qualitative data. Meaning is brought out by relating the results of the analysis to possible existing or emerging theories (Jolibert et al., 2012).

Our interpretation of the data is based on, and will follow, the analyses. We were able to compare our findings with what was presented in the literature review. Given the large amount of information analysed, we have also tried to make this interpretation as holistic and synthetic as possible. It also brings together the main points to be retained from the analysis and provides an answer to our research questions.

C.2 Content analysis of the interviews with consumers

As a reminder, one of the objectives of the qualitative study is to explore young omnivores attitudes by gaining a better understanding of their decision-making process regarding the consumption of plant-based meat substitutes (PBMS). In order to do so, 18 interviews with young omnivores were conducted to explore young omnivores' values, motivations in regards to their food consumption, and perceptions of PBMS.

The content analysis will follow the flow of the interview guide used during these interviews (Appendix 26). First, general and demographic information will be provided on the profiles of the interviewees, as well as some information on their desired benefits when purchasing food, and their motivations for eating meat. Secondly, the different perceptions they have of PBMS will be presented. This section will be divided into different product-related factors and will also analyze the expectations of young omnivores regarding several product-related factors. In addition, an analysis of the motives for consuming PBMS, as well as their trying intentions of the young omnivores will be provided. Finally, we will analyze the interest of young omnivores in reducing their meat consumption.

The frequency of answers will be mentioned under brackets. For instance, if the frequency of an idea or opinion is 5 out of 18 answers, (5) will be written after the latter. In addition, the most relevant verbatim(s) will be presented in *italic* after each finding and concept. It is important to keep in mind that these results are qualitative. The frequency of answers gives an indication of whether one aspect could be more important than another. However, this will have to be confirmed by a quantitative study. What is important here is to show the diversity in answers and opinions.

C.2.1 Profile of the interviewees

18 interviews were conducted with young omnivores, living in urban areas in Belgium.

	Gender	Age	Location	Country -side*	Living situation	Living status
<i>Interview 1</i>	Male	22	Brussels	Yes	Shared-flat	Studying
<i>Interview 2</i>	Male	23	Brussels	Yes	Shared-flat	Working

Interview 3	Female	23	Brussels	Yes	Alone	Studying
Interview 4	Female	22	Brussels	No	Partner	Studying
Interview 5	Female	25	Nivelles	Yes	Parents	Studying
Interview 6	Male	25	Hainaut	Yes	Parents	Working
Interview 7	Female	21	Brussels	No	Parents	Studying
Interview 8	Female	22	Brabant Flamand (near Brussels)	No	Parents	Studying
Interview 9	Male	22	Brabant Flamand (near Brussels)	No	Alone	Studying
Interview 10	Male	25	Louvain-la-Neuve	Yes	Shared-flat	Studying
Interview 11	Male	22	Brussels	No	Alone	Studying
Interview 12	Male	23	Brussels	No	Shared-flat	Studying
Interview 13	Male	22	Brussels	No	Shared-flat	Studying
Interview 14	Male	23	Brussels	No	Shared-flat	Studying
Interview 15	Male	22	Brussels	No	Parents	Studying
Interview 16	Female	22	Brussels	No	Parents	Studying
Interview 17	Male	19	Brussels	No	Alone	Studying
Interview 18	Female	21	Brussels	No	Parents	Studying

*lived at certain point or is living in or very near the countryside (by the parents for instance)

Important information on the panel

- The average age of our panel is 22,5.
- Most of them are currently studying, only two are currently working. The fact that most of the interviewees are students was not something chosen on purpose. It may constitute a bias and will be mentioned in the limitations of our research.

- Most interviewees live in Brussels (13) or in a French-speaking region of Belgium in an urban or semi-urban area. Some of them used to live or are currently living in or near the countryside.
- 3 different accommodation situations have been highlighted during the interviews: living alone, living in a shared flat with other students or young workers, and still living with the parents.
- 7 female and 11 male participants were interviewed.
- As a reminder, all of them are considered omnivores, thus eating meat almost every day.
- 17 participants already tried once a PBMS.

C.2.2 Desired benefits & Motivations

C.2.2.1 General purchasing criteria

At the beginning of the interview, we asked the interviewees about their most important criteria when they purchase food products in their everyday life. These criteria can be sorted according to the distinction made by Grunert & van Trijp (2014) as they are either related to self-oriented or to other-oriented desired benefits.

Food purchase criteria related to self-oriented desired benefits.		Food purchase criteria related to other-oriented desired benefits.	
Not too expensive	15	Local origin	3
Good taste	10	Organic	2
Good quality (taste)	6	Eco-friendly	3
Convenient	6		
Healthy	5		
Nice visual aspects	5		
Natural (healthy)	5		
Organic (healthy, taste)	2		

It appears that young omnivores have more self-oriented desired benefits than other-oriented ones. The price is the main desired benefit, and some interviewees justified it by their student status (7). The

second main desired benefit is the taste of the product (10). It seems that some have some criteria with regard to origin or production method, especially when purchasing meat products (4).

C.2.2.1 Motivations for eating meat

As all our interviewees are omnivores, i.e consuming meat almost every day, they are attached to meat consumption. Their motivations for eating meat can give us some insights on what they value in food consumption, their desired benefits, as well as the potential barriers to reducing meat consumption.

Four key motivations were mentioned by interviewees in regards to meat consumption, which are: good taste, a convenient product that they are used to consuming in their everyday lives, a healthy product, and a substantial product. These motivations can be linked to self-directed benefits mentioned in the previous section: taste, convenience, health.

The main motive for consuming meat mentioned by the respondents during the interviews was the pleasure (15), linked to the taste of meat.

‘D’un point de vue goût, moi, ça me plaît quand même beaucoup d’avoir de la viande. Et puis ouais, je suis aussi un amateur de bonne viande. Parfois, je vais acheter vraiment un bon morceau de viande excellent qui n’est pas très écologique non plus, mais ça fait aussi partie de ce que m’apporte la viande, c’est une dégustation.’ Interview 10.

‘Il ne faut pas se mentir, avec une petite sauce, une viande bien cuite, c’est délicieux.’ Interview 11.

‘J’adore le goût de la viande, ça me procure du plaisir’ Interview 4.

The second motive is linked to the habits, and the fact that meat consumption is something ‘normal’ and convenient as it corresponds to interviewees’ habits, culture and/or family traditions (11).

‘Il y a un truc ou automatiquement tu prends ça ou tu fais ce plat là avec de la viande sans vraiment y penser. Il y a des plats où c’est même pas manger de la viande pour le côté nutritionnel ou pour le goût, mais c’est juste ancré, automatique dans le plat, dans les habitudes.’ Interview 12.

‘C’est une norme de bien vivre et de bien manger.’ Interview 2.

‘Il y a vraiment tout un côté qui entoure cette tradition que je trouve importante. Il y a aussi le côté familial. On se retrouve autour d’un repas et je ne me rappelle pas avoir une seule fois mangé un repas de famille végétarien dans la famille. Il y a tout un procédé, un processus derrière qui me touche personnellement.’ Interview 4.

To reinforce the previous point, meat consumption is appreciated because it is convenient as you can eat whatever you want (1), and it is easy to prepare (1).

‘C’est pratique, je peux manger ce que je veux, où je veux, quand je veux. Si je vais au resto, je ne vais pas garder la carte très longtemps. Peu importe le plat qui me plaît, je le prends.’ Interview 10.

In addition, meat consumption is also appreciated for its health benefits (2). More specifically, interviewees consume meat because it is a good source of protein and vitamins (5), it gives energy (3), and it helps developing muscles (2).

‘C’est bien de manger de la viande, ça a des avantages pour la santé.’ Interview 7.

‘Ca m’apporte des protéines, ça m’apporte la vitamine qui n’est pas une vitamine B12, c’est un apport alimentaire important.’ Interview 15.

‘Un peu de viande et un peu de fromage le matin, ça va me donner de l’énergie pour la journée. C’est pour ça que je le mange.’ Interview 13.

‘J’ai l’impression que ça va aussi m’aider dans ma croissance, vois, etc. D’un point de vue développement musculaire.’ Interview 1.

Finally, a motivation that was mentioned by some of the respondents is the fact that meat is a substantial product in a meal, and that they feel full after eating it (5).

‘C’est vraiment une matière dans ton repas, c’est une substance dans ton assiette. Vraiment, je pense que j’ai encore besoin de cette substance.’ Interview 10.

‘J’apprécie le fait qu’il y ait quand même une sensation de satiété en général après avoir mangé de la viande.’ Interview 16.

C.2.3 Perceptions of plant-based meat substitutes

Interviewees were then asked to express their perceptions of PBMS on several product-attributes. The results were analysed around 6 key perceptions, following the structure of the interview guide, based on the literature review:

- Sensorial aspects (taste, texture, smell & appearance)
- Health aspects and level of processing,
- Convenience: effort needed to find, buy and prepare the products,
- Environmental and social impact,
- Price,
- Diversity in the range of products.

It appears that young omnivores have different perceptions of PBMS. What will also be interesting to highlight is that they expect certain attributes, which may suggest that some of the factors are more important than others for them.

A definition of PBMS was given to the participants during the interviews. The focus on PBMS with meat-like aspects was also explained in comparison to other plant-based substitutes such as tofu, and leguminous plants. As a reminder, all the definitions and explanations provided during the interviews can be found in the interview guide (Appendix 27).

Almost all of the interviewees were able to visualize certain PBMS products with meat-like aspects. With 9 mentions, the plant-based burgers were the most mentioned ones, followed by plant-based nuggets (7), sausages (3), kebabs or pieces of meat (2), Quorn products (2), steaks (1), and charcuterie (1).

For the following analysis of perceptions, it is important to keep in mind that the interviewees were asked to think about and visualise plant-based burgers or nuggets before giving their perceptions. As these products are the most famous ones in the range, it was easier for them to visualise and give their opinions on them. We made sure that they were able to visualise such products. Some pictures were shown to several interviewees who never saw such products before (3) (See Appendix 11).

C.2.3.1 Sensorial aspects of PBMS

The first part of the discussion on PBMS was about the sensorial aspects of the products, i.e. taste, smell, texture and appearance. Interviewees were asked to give their impressions about these aspects when thinking about the products or imagining seeing them in the supermarkets.

Taste

With regard to taste, opinions were divided. On one hand, some interviewees consider that PBMS could have a good taste. In fact, they had positive perceptions of the taste of the product due to the similarity with the visual aspects of meat, i.e the fact that it looks familiar (4), for instance:

‘Quand je vois deux nuggets, ils se ressemblent parce que c’est une enveloppe, c’est très facile. En tout cas, la panure, on peut faire la même panure. Ça a la même tête, ça va avoir le même goût.’ Interview 4.

‘A chaque fois que ça ressemble à quelque chose que tu connais, tu as plus envie de tester. Ce qui est le cas ici je trouve pour certains produits qui ont du coup l’air bons.’ Interview 2.

Details were provided on other reasons behind these perceptions of taste. In fact, some respondents said that they were satisfied with the general appearance of the products (2), or with the familiar composition of the products (1).

‘Quand tu vois un de ces produits là je ne me dis pas que ça n’a pas l’air bon (...) niveau apparence ça avait l’air grave bon.’ Interview 1.

‘C’est souvent avec des produits que j’aime bien. Du coup, ça a l’air bon.’ Interview 7.

On the other hand, four interviewees expressed a more negative opinion about the taste, due to an attachment to meat (5) or a lack of knowledge about or experience with the product (2).

‘Je pense que c’est relativement réussi, mais c’est peut-être parce que j’aime bien la viande que je suis biaisé, mais je trouve que ça a l’air moins bon.’ Interview 6.

‘Au niveau du goût, les burgers végé, je suis peut-être moins convaincu pour le goût. Parce que je ne connais pas et du coup, comme je ne connais pas je suis toujours moins convaincu.’ Interview 1.

In addition, based on their previous experience with such products, some interviewees had a negative opinion about the taste of the product on the fact that it did not taste like meat (4), and that disappointed them.

‘Pour moi, non ni la texture, ni le goût n’était intéressant car moi, j’aime bien les viandes qui ont un bon goût.’ Interview 10.

‘La fois où j’en ai vraiment mangé, ça n’avait pas un goût de viande. C’était décevant.’ Interview 15.

Appearance

The appearance is the main sensorial aspect to analyse as our panel did not consume a lot of PBMS. The visual aspects of the products seem to be essential to convince consumers to try them. As seen in the perceptions of taste, the visual meat-like aspects of PBMS are related to positive perceptions of taste for some of the interviewees. On the contrary, an unfamiliar appearance was also perceived by some respondents (6), especially on the fact that PBMS do not look like meat.

'Il y a beaucoup cet aspect négatif là où je me dis, mais ça se voit (que ce n'est pas de la viande).'
Interview 3.

'Pour moi l'apparence du faux-burger n'est pas réussie, on dirait pas du tout de la vraie viande.'
Interview 18.

An important aspect mentioned regarding the appearance of PBMS was the different colour than meat (7), which can be perceived as a positive or negative aspect.

'Tu vois un peu de vert, mais tu dis que c'est normal, tu ne demandes pas d'avoir des légumes rouges non plus.' Interview 11.

'La couleur, on voit que c'est des trucs bizarres, on voit que c'est pas de la viande.' Interview 3.

'Cette couleur qui est un peu fade, un peu plus terne que la viande qu'on voit.' Interview 4.

In addition, several interviewees pointed out that PBMS had a similar shape as meat (5), which was positive for them as it looks like the substantial food product that meat is in their perception (2).

'(La forme), c'est mega clean. Franchement, ça avait la forme des burgers, la forme des nuggets.'
Interview 11.

'Dans ma tête, le fait que cela ressemble à de la viande, je me dis que c'est quand même quelque chose de consistant.' Interview 5.

Texture & Smell

It was more difficult to collect qualitative data on these two aspects, as the majority of the respondents did not remember them well the moment they tried PBMS, or had no opinion on such specific aspects. However, some consider that the texture is more friable than meat (3), often breaded and different from meat (2), familiar (1), crispy (1):

'Pour la texture, je dirais qu'il y a moins besoin de mâcher, c'est plus friable.' Interview 11.

'Du coup, par rapport à la texture, ça n'est pas vraiment la même texture que de la viande. Il y a souvent de la chapelure autour, ce n'est pas pareil.' Interview 7.

In general, the texture and the smell were linked to the opinion one might have on the appearance (3).

'Mais comme l'apparence a l'air bien dans ma tête, si je devais imaginer, l'odeur et texture suivent directement l'apparence. Comme c'est beau je me dis que ça sent bon et que la texture est bien.'
Interview 1.

Expectations on sensorial aspects

The perceptions that young omnivores may have of the sensorial aspects of PBMS have been analysed. Several of the interviewees also had some expectations regarding the sensorial aspects. They answered the question: *'How should the product be in terms of sensorial aspects to convince you to try or buy it?'*

First, some interviewees expect PBMS to be similar to meat regarding the appearance (7), with specific requests on the same colour (3) or the same shape (1).

'Si tu appelles ça de la charcuterie je m'attendrais à ce que ça y ressemble.' Interview 6.

'Quand c'est pour remplacer vraiment la viande, hot dog, burger, etc les trucs classiques, ça me donnerait plus envie si ça ressemble à de la viande.' Interview 12.

They also had some expectations in terms of taste (5), and texture (4) that should also aim to be close to meat-based products.

'C'est important pour le goût que ça ressemble à la viande mais le reste ne va pas jouer. Et peut-être aussi un peu la texture.' Interview 7.

On the contrary, some interviewees would prefer that the product had its own taste (4), or its own natural colour (2) without tending towards meat-like aspects.

'Je ne demande pas à ce qu'ils goûtent la viande. Juste à ce qu'ils soient meilleur, juste tout seul eux, sans se soucier de la viande.' Interview 11.

'C'est pas obligé d'être exactement comme de la viande. Tu peux être vite déçu si tu t'attends que ce soit vraiment comme de la viande, mais que c'est pas tout à fait ça, tu vas te dire ah oui au final ça me manque.' Interview 5.

'Pour les viandes rouges, c'est pas naturel d'avoir des légumes rouges, à part les tomates. Faut pas qu'ils cachent, si c'est vert c'est vert.' Interview 11.

The previous findings point out the difference between young omnivores who would prefer PBMS with meat-like aspects, and the ones who would not appreciate these aspects.

C.2.3.2 Health aspects

'Do you consider these products as healthy or not? Yes, no, why?' was the question asked to the participants during the interviews. The majority perceived PBMS as healthy for different reasons and

beliefs they have regarding the product. The level of processing plays also an important role for those considering PBMS as unhealthy.

The major perception was that PBMS are healthy because they are plant-based, vegetarian, and/or made out of vegetables (10).

‘Tout ce qui est végétal est forcément associé à plus sain que le reste.’ Interview 1.

‘C’est plus une image que j’ai dans ma tête que manger végétarien, c’est sain et donc les produits végétariens doivent être sains.’ Interview 13.

In parallel, interviewees often compared PBMS to meat in terms of health benefits. The products were perceived positively as less fat than meat (2), and also as healthier than an overconsumption of meat (2), or ‘not worse’ than meat in terms of production process (1).

‘J’ai l’impression qu’il y a moins de graisse par contre.’ Interview 7.

‘Comme on surconsomme de la viande, le fait de passer à autre chose peut donner l’impression que ça rééquilibre et donc je considère ça comme plus sain qu’un surplus de viande’. Interview 9.

‘Oui, je pense que je les considère comme sains. Fabrication, composition, degré de transformation. Je pense que le pire que tu puisses faire en animal est pire qu’en végétal’. Interview 10.

On the contrary, several respondents perceived PBMS as unhealthy because of their level of processing and their composition (5).

‘C’est comme les viandes pas chères qui sont ultra transformées. Et je sais que ça, c’est cancérigène. De mémoire, en tout cas, c’est cancérigène. Non, pour moi, c’est quelque chose qui n’est pas sain du tout.’ Interview 15.

‘J’ai l’impression que c’est des produits fort transformés, et donc qu’il y a beaucoup de crasse. Au final, j’ai l’impression qu’on change un problème qui est la surconsommation de viande par d’autres problèmes.’ Interview 5.

The level of processing and naturalness of these products was also discussed during the interviews after the questions on the health aspects of the product. Interesting opinions emerged among the interviewees. In fact, PBMS were considered as (ultra) processed, industrial or unnatural by seven interviewees (7), which could also have an impact on their perceptions of the health aspects previously mentioned.

‘J’ai l’impression qu’il y a beaucoup, beaucoup d’ingrédients et ce n’est pas super transparent. C’est pas très clair pour moi ce que c’est à chaque fois. J’ai l’impression que comme c’est très transformé, on ne peut pas dire que c’est un produit naturel.’ Interview 16.

On the contrary, others interviewees considered the product as natural, and believe PBMS are natural but processed (6), natural (2), or industrial but not chemical (1).

‘Au final, j’ai un peu la sensation que ce qu’il y a dedans, ce serait naturel, mais le fait qu’on ait une transformation pour que cela tienne ensemble n’est pas très naturel non plus.’ Interview 1.

‘Oui c’est naturel. De nouveau le cliché du végétarien, qui mange sain, et prônent le fait de manger sain. Du coup, j’ai l’impression que ce sont des produits qui sont faits avec de bons aliments.’ Interview 3.

‘J’aurais tendance à dire que oui c’est industriel, mais c’est pas chimique avec des aliments sombres et louches dedans. Au contraire, ce serait un peu plus positif que négatif, fin mon image est plus positive que négative sur ce point.’ Interview 13.

Expectations on health aspects

Several interviewees for whom health is a criteria when purchasing food have some expectations regarding the quality and health aspects of PBMS. For instance, the composition should be ‘clean’ (free-from) with natural ingredients and it should not be too processed (4/6).

‘Finalement tu forces un truc qui n’est pas naturel, c’est ça. C’est pas censé ressembler à de la viande. Du coup, tu multiplies les trucs, et en plus de ça tu as fait des expériences, des bazars et des trucs pour en arriver là. Moi, je suis très intéressé par cette question. D’ailleurs, c’est peut-être l’une des raisons pour laquelle je ne vais peut-être pas en acheter tout de suite.’ Interview 4.

Interesting to notice is that these four consumers were also part of the ones having health concerns on the level of processing of PBMS.

Moreover, for other interviewees, PBMS should give energy, and be as nutritious as meat (4/6).

‘Si c’est plus sain et que tu as la même teneur en protéines et en plus de ça, c’est préparé de façon saine, avec un mélange de légumes ou d’autres choses, ça pourrait m’inciter à en acheter.’ Interview 8.

Finally, some interviewees expect more information about the health benefits of the product, and would like these products to be more transparent (5).

‘Pour les gens comme moi qui ne savent pas si c’est bien ou pas pour leur santé, je pense que ce sera intéressant de mettre sur les boîtes, de mettre plus clairement et en termes plus simples que vraiment juste la liste des ingrédients, les informations importantes et pertinentes sur l’impact sur la santé.’ Interview 16.

‘J’aimerais bien avoir une information sur l’équivalence de ce produit vis-à-vis de la viande et des végétaux, en protéines par exemple. Avoir cette information enlèverait un peu une image transformée et opaque de ces produits à mes yeux.’ Interview 18.

‘S’ils pouvaient même dans leur pub, à la télé ou sur une vidéo sur YouTube, juste prouver avec quelques images que le processus est sain et que, au final, le produit n’est pas du tout artificiel.’ Interview 17.

C.2.3.4 Convenience

Interviewees were asked specific questions on the level of effort perceived as necessary to find and purchase PBMS in their cities, as well as the effort needed to prepare and integrate them in their everyday meals.

Place

Regarding the level of effort needed to find a place selling PBMS, the majority consider it as easy, as PBMS can be found in almost all the supermarkets (12) and organic stores (1).

‘Alors, même dans les grandes surfaces, on les trouve, ça paraît disponible partout.’ Interview 2.

The latter is qualified by the fact that it was also perceived as difficult to have options with PBMS in restaurants or snacks (8). Moreover, interviewees perceive that the large range of PBMS is only available in specific stores (2), and that it is more difficult to find PBMS in small supermarkets (1).

‘Pour le moment j’ai l’impression qu’on les retrouve principalement en supermarché. Mais ce serait chouette de les avoir intégrés dans l’offre de sandwicherie, dans des restaurants, dans des restaurants de burger.’ Interview 14.

‘T’auras qu’un choix maximum dans la plupart des snacks et restaurants.’ Interview 10.

‘C’est sans doute plus compliqué de les trouver dans des plus petits, style carrefour express.’ Interview 14.

Expectations on place

Interestingly, five interviewees mentioned the fact that they would not go to a specific store to buy such a product (5): *‘Je vais toujours en grandes surfaces. Donc, s'il faut que je commence à aller chercher autre part en grande surface, je ne pense pas que ce sera une démarche que je ferais.’* Interview 1.

Moreover, several interviewees pointed out that they expect to find those products next to the meat products in the supermarkets (4): *‘Si, par contre, ils sont dans un rayon spécial végé qui n'est pas dans le rayon viande. Ben moi, en tant qu'omnivore, jamais je ne serai allé dans le rayon végé.’* Interview 2.

Preparation time

PBMS were mainly perceived as easy to prepare. The majority of interviewees believe they are easier to prepare than meat (9) or not complicated to prepare (8).

‘Pour moi, ce qui est compliqué à cuisiner, c'est quand il y a une longue recette, que c'est un produit qui peut vite cramer ou brûler, ou quand il y a plein d'étapes. Je n'ai pas l'impression que ce soit le cas pour ces produits là.’ Interview 1.

‘A mon avis, c'est même plus simple qu'une viande. Une viande c'est hyper complexe en terme de cuisson, donc je pense que c'est beaucoup plus simple. J'ai l'impression que je dois juste le mettre au micro-ondes, ou bien au four ou à la poêle, mais comme un cordon bleu.’ Interview 2.

On the contrary, PBMS were perceived by other respondents as quite complicated to prepare if you are not used to it (2): *‘Je pense qu'il faut se renseigner un peu quand même pour ne pas détruire le produit que tu viens d'acheter. En fait, je ne pense pas que ça soit compliqué, mais je pense qu'il faut un peu se renseigner.’* Interview 4.

Moreover, it may require an additional effort to think about how to integrate such products in their meals (2), and interviewees expect to have more information on how to integrate such products in their everyday meals (4).

‘Je devrais aller voir sur internet pour des recettes plus élaborées. J'aurai pas assez de répertoire de plats avec ces produits pour le coup.’ Interview 12.

‘Là, maintenant, tout de suite, je ne vois pas trop avec quoi je pourrais manger. Déjà, d'un point de vue comme je ne consomme pas, je ne sais pas avec quoi ça marche bien. Ce serait plus un effort de est ce que ça irait bien et qu'est ce que je vais mettre avec?’ Interview 1.

‘(J’aimerais avoir) plus de connaissances sur comment les intégrer à mes plats pouvant venir d'internet

ou de personnes que je connais qui m'ont recommandé d'utiliser, de tester tel produit dans tel plat.' Interview 12.

'Pour les substituts végétaux, m'inonder d'images de substituts ne va pas me donner envie d'en acheter, par contre me donner des idées sur comment les consommer et avec quoi, ça pourrait marcher. Un peu en mode Hello Fresh, avec une recette limite dessus. Pour me guider et m'éduquer.' Interview 1.

C.2.3.5 Environmental and social impact

Interviewees were asked about their opinion on the environmental and social impact of PBMS. Most of them perceived as more eco-friendly than meat (7).

'Intuitivement, ça me semble d'office, moins polluant que tous les élevages.' Interview 1.

'J'ai clairement l'impression que je respecte plus la planète si je consomme un burger végétarien que si je consomme un steak haché.' Interview 13.

The latter should be qualified however as some interviewees consider PBMS as more eco-friendly than meat but not more than other products (4), and some also mentioned that it could have a negative impact on the environment (3), also due to their raw materials (1).

'Je ne dirai pas qu'ils sont fondamentalement bons pour l'environnement, ces produits, je dirais qu'ils sont beaucoup moins nocifs que la viande, qui pollue et consomme beaucoup d'eau. Dans l'absolu je ne sais pas, mais relativement à la viande c'est mieux.' Interview 11.

'Les packaging sont toujours en plastique, et j'ai pas l'impression que ce soit produit de manière plus écologique que d'autres produits.' Interview 14.

'À mon avis, les industries derrière ne doivent pas être 100% réglo et on découvrira ça dans les prochaines années.' Interview 2.

'Il me semble qu'il y a beaucoup de soja en général dans ce genre de produits et je sais que ça pollue pas mal.' Interview 16.

In fact, some interviewees have doubts and would like to have more information on this aspect (3). *'Par rapport à aussi à la production, je serai intéressé, maintenant on peut tracer des viandes, pourquoi pas tracer des burgers végétariens. D'où vient le quinoa du Pérou? Tu vois, je n'en sais rien, mais c'est important d'être transparent sur ça.'* Interview 4.

Regarding social impact, five interviewees considered that these products could have a positive impact linked to better animal welfare (5).

‘Créer des substituts, c’est permettre un peu à ces pauvres bêtes de souffler, je pense d’une façon ou d’une autre.’ Interview 4.

‘Mais je trouve que d’un point de vue éthique, je trouve que c’est pas mal parce qu’on repense à nos modes de production et notre manière dont on exploite par exemple les animaux. On réfléchit à faire autrement pour toujours avoir nos sources en protéines, mais sans devoir tuer trop d’animaux.’ Interview 5.

However, most of them did not have any opinion about the social impacts of consuming PBMS, and did not think about animal welfare (13). *‘Je ne pourrai même pas te dire quel impact éthique cela a.’ Interview 14.*

C.2.3.5 Price

On one hand, the price of PBMS is perceived as high (8). PBMS were also benchmarked with other products by interviewees. For instance, they are perceived as more expensive than cheap meat (3).

‘Comme c’est nouveau, comme c’est un truc naturel, végétal et qui, en même temps, est recomposé pour faire quelque chose de stylé, ce sera forcément quelque chose de plus cher.’ Interview 1.

‘C’est probablement plus cher que de la viande de mauvaise qualité, mais c’est probablement moins cher que de la viande de bonne qualité.’ Interview 6.

On the other hand, PBMS are perceived as less expensive than qualitative meat (4) and not more expensive than meat (1). Finally, they were considered as being priced to an acceptable price (3).

‘Il me semble que ces produits valent 3-4 euros, ce qui est ok pour une ‘viande’, ça reste moins cher que la plupart des bonnes viandes’ Interview 18.

‘J’ai pas l’impression qu’ils soient excessivement cher et je n’ai pas l’impression qu’ils soient super accessibles, en tout cas comme ça l’impression que j’ai.’ Interview 9.

‘J’ai jamais regardé les prix, mais je pense pas que ça soit plus cher que de la viande’ Interview 4.

C.2.3.6 Diversity in the range

In terms of the diversity of options and choices in the range of PBMS, most respondents have the impression that there is a lot of choice from different brands but not a lot of variety, as these are all the same type of products (7).

'Il y a peut-être 50 marques, mais au final, t'as qu'un seul type de produits, quoi. Ce n'est pas comme si tu vas à la boucherie ou tu as 4,5 races et une infinité de morceaux ou je ne sais combien de morceaux différents.' Interview 15.

Others considered that there is not a lot of choice in the range of PBMS, and little variety (6): *'J'ai pas l'impression qu'il y ait vraiment des dizaines de possibilités, que c'est plutôt toujours les mêmes steaks végétaux ou nuggets, et qu'il n'y a vraiment pas des tonnes de choix. J'ai jamais vraiment commencé à regarder, mais ma première idée c'est que c'est souvent les mêmes produits.'* Interview 12.

These findings highlight a potential consumer need for product development towards more diversity.

C.2.4 Motivations towards PBMS

Motivations to consume PBMS

Interviewees named several motivations for consuming PBMS while answering the question: *'What would make you purchase PBMS?'*. These motivations highlight the perceived drawbacks of meat consumption in regards to the environmental impact, the expensive price, the conditions for animals, and the health concerns.

The main motivation for our interviewees would be the good taste of the product itself (10). PBMS should be tasty for the majority of the interviewees to purchase and consume them. In other words, they expect PBMS to have a good taste.

'L'apparence peut jouer dans un premier rôle, avant d'avoir goûté. Mais après l'expérience, ce qui prime le plus c'est le goût. Si c'est bon alors je pourrais en acheter.' Interview 11.

'Si j'en mange une fois et que je trouve ça bon, peut être que j'en rachèterais.' Interview 6.

'Si jamais c'est bon, je ne vois pas pourquoi je n'achèterai pas ça plutôt qu'une pièce de viande.' Interview 14.

The second motivation would be the price (9). Interviewees would be ready to consume PBMS if they weren't too expensive (7), and if they were less expensive than meat (7) which highlights one of the drawbacks of meat consumption.

'Qu'ils réduisent leurs prix parce qu'il y en a qui coûtent cher.' Interview 7.

‘Si c’est pas trop cher, je pourrais éventuellement me laisser tenter une fois.’ Interview 1.

‘Si jamais le substitut est moins cher que la viande, qui des fois est quand même super cher, alors c’est vrai que ça pourrait me faire réfléchir.’ Interview 18.

The third reason to consume PBMS would be the positive environmental impact of PBMS compared to meat (8). The majority of young omnivores are aware of the negative impact of meat on the environment (10), and it could motivate them in the future to switch to PBMS.

‘En gros, le jour où je change complètement et que je prends des produits substitués végétaux, ce sera pour la seule raison de l’aspect environnemental.’ Interview 2.

‘Ce qui commencerait peut être aussi à me faire acheter ça, c’est l’aspect écologique.’ Interview 12.

‘Oui, je pense que le premier facteur qui joue pour moi aussi, c’est que ça me permet de consommer moins de viande, ce qui a un impact sur l’environnement.’ Interview 16.

In addition, the fact that PBMS do not imply animals and is therefore better than meat in terms of animal welfare was also mentioned by the interviewees as a potential motivation (3): *‘Je trouve ça bien que d’un point de vue éthique on réfléchisse à faire autrement pour toujours avoir nos sources en protéines, mais sans devoir tuer trop d’animaux.’ Interview 5.*

Health benefits of PBMS could also be a motive for certain respondents (3), and especially on the fact that it could be considered as healthier than an overconsumption of meat.

‘Je ne consommerai pas ces produits pour leurs protéines mais plus parce qu’il y a des légumes dedans, et me dire que c’est meilleur pour la santé.’ Interview 12.

‘Le fait que ce soit sain, c’est une des raisons pour lesquelles je les achèterais. Après sain à 100% je ne sais pas, mais en tout cas ce sera plus sain qu’une surconsommation de viande.’ Interview 9.

Finally, PBMS would also be purchased if they are convenient to eat (3)

‘Si tu as des produits qui vont dans cette optique là, donc qui sont simples d’utilisation, rapides à cuisiner, simples à trouver je pense que ça marcherait bien, oui.’ Interview 12.

It is interesting to note that the interviewees mention the environmental and the animal welfare as

motivations for consuming PBMS. However, these motivations were not as reflected in their food purchasing criteria.

Motivations to try

During the interviews, respondents have highlighted several external factors that could positively influence them towards testing PBMS. They answered the question: *‘What could influence you to try PBMS?’*.

The main external influence would come from interviewees’ social environment (i.e friends, roommates) (11), for instance via a friend offering a first experience with PBMS at a dinner, or providing more information and ideas on PBMS.

‘Déjà, d'un point de vue information et ses propres expériences aussi, en fait un peu tu peux considérer que moi je n'ose pas et j'ai besoin de quelqu'un qui m'enlève cette peur. Et ensuite, voilà. Et ça peut se faire de plusieurs manières. Par une expérience, par de l'information, par une idée.’ Interview 1.

‘Les nouveaux produits que je goûte, c'est plus mes potes qui en ont acheté et qui me disent de goûter. Si j'ai un pote qui me dit ‘j'ai trouvé des falafels au carrefour, c'est dinguerie’. Là, je vais aller voir, c'est plus dans ce sens là que ça marche. Mais moi, tout seul, je ne vais même pas aller dans le rayon.’ Interview 12.

‘Je pense réellement que certains amis peuvent faciliter cette expérience positive.’ Interview 9.

The second type of external influence would come from the companies and their advertisements (10).

‘Je suis très, très influençable. J'ai remarqué récemment. Très, très influençable par rapport à tout ce qui est pub de nourriture sur les réseaux sociaux, c'est terrible. Je reçois des pubs, et le lendemain, je suis en train de manger ce qu'on m'a recommandé.’ Interview 16.

With regards to other marketing actions, two external factors were mentioned by interviewees; tastings in supermarkets to find out if they like it (3), and discounts in supermarkets to make the products more affordable and attractive for a trial (2).

‘Petit carré, je goûte et si c'est bon alors je pourrais acheter.’ Interview 11.

‘Des dégustations en magasin? S'il y a de la nourriture gratuite, d'office que je goûte !’ Interview 6.

‘Des petites promos. C'est déjà un peu moins cher. Et puis ça te permettra de dire tiens, je connaissais

pas ce petit truc là, j'essaierai bien.' Interview 5.

C.2.5 Trying & purchasing intentions

We will now present the type of PBMS products some of the respondents would be ready to try, purchase and/or eat, and in which situations. Questions on these aspects were planned for all the interviewees. However, some of them did not have any opinion as they could not imagine themselves trying or consuming such products.

C.2.5.1 Products

Some interviewees mentioned several types of PBMS they might try or purchase in the future:

- Products to substitute meat in specific meals such as mince or burgers (5).

'Ce serait aussi bien d'avoir du choix d'alternatives pour des plats classiques comme l'hâchis parmentier.' Interview 12.

- Products for their everyday meals such as cold cuts / *'charcuterie'* or sandwich spreads (3) with similar taste and still fast and easy to eat.

'Ce qui pourrait faciliter la transition, c'est que je trouve un truc qui substituerait la charcuterie, soit en termes de goût parce que je n'ai pas envie de manger un truc dégueu, et aussi en terme de ce que ça m'apporte' Interview 13.

'Les tartinades végété, je consomme beaucoup de tartines, pains, et c'est rapide à faire. Ça peut être une bonne alternative.' Interview 9.

- Products with breadcrumbs such as falafels, nuggets or cordon bleu (3)

'Les nuggets c'est de la malbouffe de base, donc ça ne me gêne pas.' Interview 2.

- Products with interesting compositions (2)

'J'aimerais voir différentes compositions avec différentes bases, différents légumes.' Interview 7.

On the other hand, several interviewees mentioned that they would reject or never buy certain types of PBMS such as:

- Plant-based substitutes of high-end meat products (entrecôte steak, duck breast, etc), as they are too attached to these products (5)

‘Déjà, aucune chance que j’achète, par exemple un steak ou une viande, une viande pas transformée de bœuf ou une entrecôte. Tout ce que tu veux. Aucune chance que je prenne un substitut pour ça.’ Interview 6.

‘Par contre le magret de canard en alternative végétale, franchement ça m’exciterait tellement pas. J’aurai pas envie de tester. Les côtes d’agneau aussi, en fait les produits un peu plus luxe ne m’attirent pas du tout.’ Interview 2.

- Plant-based ‘charcuterie’, as it would be weird or against the traditions (4).

‘La charcuterie, pour moi c’est incompréhensible et je ne serais pas confiant avant de l’acheter. Ce serait bizarre et je pense pas que j’en achèterai.’ Interview 1.

‘Je suis Française, et la charcuterie c’est trop beau et bon. Et c’est vraiment un truc, pour rien au monde, j’ai envie de la remplacer. Il y a des trucs que je me dis allez, je pourrais quand même tenter le coup. Mais alors, ça, no way. Il y a une tradition qui va avec, c’est le petit Savoyard avec son saucisson content parce qu’il a passé son année à le faire sécher et tout.’ Interview 4.

C.2.5.2 Situations

Interviewees have had different opinions about the situations that seem to be appropriate to try or consume PBMS. The majority consider they could eat PBMS when having dinner with some friends (9), and even more likely if vegetarians are present at the dinner.

‘Avec mes amis parce que j’en ai certains qui sont végé ou flexitariens et du coup, c’est plus cool si on mange tous la même chose.’ Interview 7.

‘Et du coup, je dirais en coloc, c’est approprié. C’est plus approprié quand il y a quelqu’un qui cuisine et qui est végétarien. Si c’est moi qui cuisine, acheter des produits qui vont respecter le régime des végétariens, et si un végétarien, cuisine alors il pourrait faire du végétarien pour tous.’ Interview 13.

Other situations are when going to the restaurant or to a snack (6), with the family (3), and when ordering food (1).

‘Je pourrais éventuellement me laisser tenter par un substitut lorsque je prends un burger au restaurant, ou quand je mange un snack avec des potes.’ Interview 18.

‘Après en famille mes parents mangent de la viande, mais ne sont pas non plus amoureux de la viande. Donc je sais qu’en famille, on peut manger ça facilement.’ Interview 5.

‘Que je puisse commander un Poké Ball avec un truc qui ressemble à du saumon ou à du thon. Ou des sushis où il n’y a que des trucs végétariens et des trucs bons, pas des sushis avec du tofu.’ Interview 13.

Interestingly, eating some PBMS in a restaurant or in a fast-food is linked to specific motives mentioned by the interviewees:

- *'It is easy to try and have a first experience.'* Interview 17.
- *'There is no need to purchase & prepare it.'* Interview 4.
- *'It could be tastier than the current options.'* Interview 14.
- *'It would give me an idea on how to prepare it.'* Interview 1.

Important to notice, eating PBMS alone and at home was also considered as an option by some interviewees (3). *'Dans une situation du quotidien où t'as pas trop envie de cuisiner c'est parfait, parce que c'est déjà tout fait.'* Interview 14.

On the contrary, some situations were mentioned as inappropriate to consume PBMS. For instance, when cooking for others (2), eating alone (2), when meeting people you don't know (1), or in formal situations (1). This is due to the fact that PBMS are perceived as not being the right products to offer something tasty enough and because of a certain social pressure:

'Je n'en cuisinerai pas quand, par exemple, je reçois, parce que quand tu reçois, tu veux vraiment faire plaisir, et j'ai l'impression que c'est plus goûteux si je fais de la viande. Cela reste quand même une norme au final.' Interview 2.

'Je ne prendrai pas de produit de substitut végétarien pour des rencontres d'inconnus ou des rencontres professionnelles. Ce n'est clairement pas un truc qui me serait propre. Pas par peur que le produit ne leur plaise pas mais l'idée que soit un produit comme ça, les gens ne vont pas connaître et pourraient trouver ça bizarre.' Interview 1.

C.2.5 Interest in reducing meat consumption

We presented at the beginning of the analysis the attachment of omnivores to meat consumption, and their motivations towards it. However, most of them also perceive the drawbacks of such a consumption as seen in their motives for consuming PBMS, and it is interesting to highlight their different opinions in regards to meat reduction.

During our interviewees, different opinions towards meat reduction can be analysed. On one hand, some interviewees were open to reducing their meat consumption in the future. On the other hand, some reject this eventuality.

In fact, several interviewees considered flexitarianism as a good compromise and diet to adopt in the future (11), and are therefore open to reducing their meat intake in the future.

'Je trouve que c'est franchement une bonne idée et que c'est quelque chose de bien, auquel je songe, mais je n'ai pas encore passé le cap. En premier step ou un step où tu restes tout le temps je trouve ça bien.' Interview 12.

'Je trouve que le flexitarien, c'est un bon compromis dans le sens où il ne renonce pas non plus à manger de la viande pour toujours.' Interview 16.

On the contrary, several interviewees have strong barriers towards meat reduction – either it is not their priority or they don't feel the need to do it (7).

'Je suis conscient du potentiel danger accompagnant la consommation de viande, autant pour la santé personnelle que pour l'environnement ou pour le bien-être des animaux. Mais je mets de côté ces considérations en mangeant ma viande.' Interview 18.

'J'ai essayé, car je suis conscient que je mange beaucoup de viande, après le rapport coût bénéfice de diminuer la quantité de viande n'est pas assez intéressant pour l'instant.' Interview 15.

'J'ai déjà essayé de réduire et de faire plus attention, mais il faut choisir ses combats et ce n'est pas ma priorité.' Interview 14.

'Je ressens pas l'intérêt de changer vu que je ne suis pas en mauvaise santé. Je ne suis jamais malade, j'ai rien.' Interview 11.

However, some of the interviewees who are not willing to reduce their meat consumption have adapted or have the intention to adapt their meat consumption (5/7) by avoiding certain types of meat like beef (3/5), by reducing the amount they consume (3/5) and/or by purchasing more qualitative and local meat (2/5). This highlights the fact that some young omnivores are very attached to meat consumption, but still want to consume in a more responsible way.

'Je réduis en termes de gramme par pièce de viande et surtout en termes de type de viande. Je prends plus de la volaille que de la viande rouge, ça, c'est évident et je pense que c'est déjà bien.' Interview 2.

'J'arrête déjà de manger les bébés, le veau et l'agneau. Je veux dire, c'est ridicule mais pour moi c'est un premier pas.' Interview 3.

'Aujourd'hui, je pense que déjà, je classe la viande. Je crois que c'est plutôt en terme écologique, mais je classe les viandes de la moins écologique à la 'plus' écologique, donc du bœuf, au porc, au poulet.' Interview 10.

'J'aimerais essayer de réduire les quantités par plat, mais pas la fréquence.' Interview 18.

'Je ne me suis jamais dit que j'allais diminuer ma consommation. Je voudrais augmenter la qualité plutôt que de modifier la quantité.' Interview 1.

In parallel, interviewees were asked about their opinions on vegetarianism. It was perceived as too extreme by several of them (6). The others did not have a precise opinion, stating that *'everyone is free to eat what they want, and we have to respect it'*, and not showing particular interest in adopting such a diet.

'Je trouve que le monde se porterait vraiment bien si tout le monde était flexitarien, mais bien flexitarien, si tout le monde faisait attention. Le problème c'est qu'il y a des gens qui doivent le faire à fond, 100% zéro viande, et c'est allé dans l'extrême. Moi, j'aime pas trop les extrêmes en général.' Interview 10.

Meat reduction and PBMS consumption

We believe it is interesting to highlight one last important finding. In fact, interviewees who were potentially willing to reduce their meat intake (11/18) will not necessarily substitute their meat by plant-based meat substitutes, which leads to two different types of behaviours.

In fact, several interviewees mentioned that they would not replace their meat with PBMS if they had to cook vegetarian meals (5).

'Je serais plutôt dans le mode j'achète moins de viande, mais je ne la remplace pas forcément, tu peux faire des pâtes sauce tomate ou des pizza quatre fromages. Je serai plus dans ce mode là, cuisiner sans viande du tout.' Interview 11.

'On peut cuisiner des trucs tout à fait végés sans acheter des substituts tout faits pour toi et au final, tu peux manger des pâtes tomates, basilic, burrata, sans avoir besoin de substituts. Je changerai carrément ma façon de manger, je passerai de la viande, les pâtes et les légumes à un plat autour du féculent, qui sera l'ingrédient principal, alors qu'avant c'était la viande.' Interview 3.

'Je ne vois pas l'intérêt de remplacer un steak par un truc qui ressemble à du steak. Tout comme je ne remplacerais pas de la salade par de la viande qui ressemblerait à de la salade.' Interview 6.

However, some interviewees would still adopt PBMS to substitute meat in their meals because it is essential for them to replace meat in some way (6).

‘Si je réduisais ma consommation de viande, il faudrait que je me renseigne sur des alternatives. Il faudrait donc que je réduise ma consommation de viande pour commencer réellement à m'intéresser à ces substituts.’ Interview 12.

‘Je pense que si je mange moins de viande, ça offrira d'office de la place à des substituts, car je ne me vois pas faire une grosse quantité de repas où il n'y a aucun des deux. Donc, je pense que la baisse de l'un engendre d'office la hausse de l'autre.’ Interview 9.

Based on this section on meat reduction, it appears that different consumer profiles emerge in the panel of interviewees.

As a conclusion, this analysis allowed us to have a better understanding of young omnivores' motivations towards food products and meat consumption, and towards PBMS. Moreover, it turned out that their perceptions of PBMS could be very different, and they expressed some expectations regarding these products. Finally, it was possible to analyze their intentions to consume these products and what behaviors they might adopt in their future regarding their meat consumption.

C.3 Content analysis of the interviews with professionals and experts

As a reminder, the qualitative study aims to explore the impact of external factors on the market for plant-based meat substitutes (PBMS), as well as to explore the importance of product development. In order to do so, 14 interviews with professionals and experts were conducted to explore the impacts of external factors on their activities and to have their opinions on the different marketing strategies to adopt.

The content analysis will follow the flow of the interview guide used during these interviews (Appendix 27).

First, we will provide some information on the profiles of interviewees. Then, we will examine external factors and their impacts on the market for PBMS. Finally, the different marketing strategies will be analyzed using the framework 4Ps - Place, Price, Promotion and Product, presented by Baker (2014) in the literature review. We will also put a strong focus on analyzing 'Product Development' strategies.

As in the previous analysis, the frequency of answers will be mentioned in brackets. The context of the interview can also be provided in brackets in the verbatims.

C.3.1 Profile of the interviewees

14 interviews were conducted with professionals and experts. In the interests of data protection, only the positions of these persons and the type of organizations in which they work will be presented. Moreover, all the names of companies will be removed from the '*verbatim*s' when needed.

	Positions	Type of organisations
Interview 1	Category Manager (including PBMS)	Retailer (B2C)
Interview 2	Global Brand Manager (including PBMS)	Retailer (B2C)
Interview 3	Category Manager (including PBMS)	Retailer (B2C)
Interview 4	Sustainability Coordinator - Purchasing Department	Retailer (B2C)

Interview 5	Founder	Brand (B2C & B2B)
Interview 6	Regional Marketing Director	Brand (B2C & B2B)
Interview 7	Product Manager	Brand (B2C & B2B)
Interview 8	Community Manager	Brand (B2C & B2B)
Interview 9	Head of Sales	Private label producer (B2B)
Interview 10	Head of Sales	Private label producer (B2B)
Interview 11	Director	European think tank
Interview 12	Policy Manager	International non-profit organisation
Interview 13	Science & Technology Research Fellow	International non-profit organisation
Interview 14	Head of Sales	Belgian non-profit organisation

Important information

Out of 10 companies, three different types of companies are represented: retailers, brands and private label producers, and two different types of business models: business to consumer (B2C) and business to business (B2B).

- The 4 retailers sell PBMS in Europe (including Belgium) via their supermarkets to consumers (B2C).
- The 4 brands sell PBMS in Europe (including Belgium) to retailers, or via their own distribution channels to consumers (B2B & B2C).
- The 2 private label producers sell PBMS to brands and/or retailers active in Europe (including Belgium), and these companies will use these PBMS under their own brands (B2B).
- Interviewee 12 and interviewee 13 are working for the same non-profit organization.
- The three non-profit organizations and the think tank have activities politically, socially or economically related to the market for PBMS.

C.3.2 External environment

In a first step, we discussed the external factors influencing the market for plant-based meat substitutes. The interviewees were asked to give their opinion on the following 6 factors: political and legal, economic, socio-cultural, technological and environmental, and what impact these factors might have on their activities.

C.3.2.1 Political & legal factors

When examining political factors, we must differentiate between the policies of the Belgian government, and the ones of the European Union (EU), and we can already sort these factors into barriers or drivers.

Barriers

The major political factor mentioned by the professionals refers to the limitations on the labelling or packaging of PBMS (8), and more precisely on the fact that there was a ban on meat-names such as 'burgers' or 'steaks'. Meat lobby groups might be behind such measures (2).

'I think it's largely driven by pushback from the traditional companies actually going because they're trying to protect their products of traditional meat, traditional dairy, and they don't want their customer base to be infringed upon. So, I see that as being like lobbying from those businesses, sort of pushing back.' Interview 13.

According to some interviewees, this has strong impacts on the sector as companies have to adapt their marketing strategies, and consumers might find it harder to identify the product, for instance:

'It's very difficult to position your products in the market if you can't relate to any flavors.' Interview 1.

'The problem is that if you make a veggie sausage, and you cannot call them sausage, then the consumer has more difficulty to know what to do with it, how to use it in the kitchen. But it is super important that you can compare it to the original product, otherwise consumers will have difficulties and will say 'OK, nice product, I don't know what to do with it'.' Interview 7.

According to several interviewees, the EU removed this restriction for PBMS from the new Common Agricultural Policy (4). However, these labelling restrictions could still be implemented at a national

level, for instance in Belgium (3), which means that global brands have to adapt their marketing strategies to each national law or guideline, which can be expensive and complicated.

'At the national level, we now see more and more initiatives to try to propose similar restrictions. In France, for example, there's a law still going to come into effect, or going to pass, basically proposing similar restrictions. There's also a conversation in Belgium at the national press on this as well.' Interview 12.

'C'est compliqué, chaque membre peut un peu faire ce qu'il veut, ce qui est très étrange. En Belgique, ça ne sera pas une loi mais des directives, mais ça peut se transformer ensuite en loi. Et on attend maintenant le next step, soit un document final, soit c'est annulé. Ça va impliquer énormément de frais parce que tous ces producteurs belges, mais aussi internationaux vont devoir changer leurs emballages, leur marketing, etc.' Interview 14.

Moreover, some professionals mentioned the fact that due to EU's subsidies the price of meat products can be very low which makes it difficult for PBMS to compete with such prices (6).

'Quand on achète de la viande, on ne l'achète pas à son vrai prix. Parce que c'est hautement subventionné par la PAC (Politique Agricole Commune).' Interview 10.

'Le plus grand problème provient du fait que la viande est très subsidiée, ce qui fait qu'elle est moins chère, ce qui crée un obstacle au développement du marché des substituts végétaux à la viande. La viande n'est pas assez chère, ce qui n'incite pas les gens à changer leur consommation.' Interview 5.

Furthermore, the EU has very strict legislation on Novel Foods, which is seen as a barrier to the market by one interviewee (1), as it limits innovation and requires time and effort to deal with it.

'La législation novel food vient clairement limiter ce que tu peux faire en matière d'innovation alimentaire et à quelle vitesse tu peux le mettre sur le marché. C'est clairement, de très loin, la loi la plus restrictive au monde. Il y a des entreprises qui font parfois des innovations qui sont super, qui sont commercialisées en Asie, aux Etats-Unis et qui ne le sont pas en France ou en Europe.' Interview 10.

'Ce qui est très difficile avec Novel Food, c'est que c'est très difficile de savoir si un produit tombe dedans ou pas, il y a un espèce de flou. (il y a un) entre deux, c'est toujours très, très, flou en fait. Ça demande du temps, des efforts.' Interview 10.

Drivers

On the other hand, some political factors were mentioned as market drivers.

Several interviewees mentioned that certain subsidies will be allocated to enhance the production of protein-rich plants (PRPs) in Europe (2), and in Belgium (3). The purpose is to reduce the level of dependency on soy that has a negative connotation and image (1).

‘There are a lot of subsidies from the government to help farmers to produce peas or mushrooms in Belgium as an alternative to soy, which is good because soy has a negative connotation.’ Interview 1.

This will have a positive impact as it will reduce the price of raw materials and therefore of PBMS; for the moment, prices are high as there is more demand than supply of PRPs (2).

‘The trouble is with the fast-growing market, raw material supply will be more and more difficult, and we will sometimes be out of stock of some raw ingredients.’ Interview 7.

Moreover, some professionals mentioned Research & Development funds from the EU (3), which could benefit the plant-based sector as this research can enhance the development of open access sciences and allow crops optimization.

‘Horizon Europe, the new multiannual research funding framework of the EU, there are three points in there that specifically mentioned alternative proteins. And there is one specifically on optimising crops for plant-based food production, and that’s an area where a lot of progress can be made for the market’. Interview 12

Two interviewees mentioned a specific French law called EGalim that could have a positive impact on the market for PBMS as it imposes vegetarian meals in institutional or school catering (2).

‘Le gouvernement a mis en place une règle qui est de faire au moins un repas végétarien par semaine dans les cantines scolaires, ou d’entreprises aussi. Et ça c’est vachement fort comme message, ça permet d’éduquer les enfants dès le plus jeune âge.’ Interview 2.

Nothing was mentioned for Belgium specifically, but two others mention the fact that the EU is also trying to educate consumers towards a plant-based diet (2).

‘There is the EU farm to fork strategy that doesn’t speak specifically to reduce livestock, but it does speak towards a shift to a plant based diet and to reduce red meat and processed meat consumption for reasons of health or reasons of sustainability.’ Interview 12.

Finally, one professional also mentioned the increasing influence of political associations and NGOs in Belgium (1), which creates more consumer awareness.

‘NGOs and associations are putting a lot of pressure and they have big and loud communication which targets also our customers. And so the customers are getting also aware of the animal welfare topic as we can say it like that. So that's one of the reasons why the trend is getting harder.’ Interview 3.

C.3.2.2 Economic factors

Regarding the economic factors, one professional mentioned the fact that we live in countries with high living standards, which allows us to purchase PBMS (1): *‘We have high living standards and we can make this type of choice, towards plant-based meat alternatives.’ Interview 7.*

In addition, the increasing level of competition on the market is considered as a main economic driver by several interviewees (5): *‘The market is growing fast and there will be many new players. It will be a market like dairy and meat in the future.’ Interview 7.*

First, the role of the largest retailers is a driver for the market, as they make products affordable for a big number of consumers via their own private label (3), and offering visibility to PBMS on their shelf spaces (4).

‘Le retailer c'est celui qui fait face au marché et donc à la fin, il a toujours un rôle dans la part de lumière qu'il donne à ces produits là et de la visibilité qu'il donne à ces produits là.’ Interview 10.

‘C'est super qu'il y ait des retailers comme Aldi et Lidl qui aient leurs propres marques. Leur haché vegan coûte 2 euros 3 euros, et ça permet vraiment de proposer ces produits au plus grand nombre.’ Interview 14.

‘Je pense que notre avantage c'est la force de frappe, tu as quand même une résonance qui peut être très importante. Et ensuite, l'accessibilité, car tu permets en fait à tout le monde d'avoir accès à ce type de produits, qui de base sont assez chers.’ Interview 2.

‘Retailers are the pioneers, they bring the products to the people, for example, what Albert Heijn is doing in Holland, it's really supporting the market by giving us more and more shelf space in the supermarket. That's the main thing, give us the space to sell our products.’ Interview 7.

‘We need private labels to offer a more competitive range to a customer, a little bit lower price because the national brands are more expensive.’ Interview 1.

Moreover, for some interviewees the increasing level of competition acts as a market driver, as big traditional companies in the food sector are entering the market and are ready to invest in marketing and R&D (3), which benefits the overall market for PBMS.

‘Les entreprises de viande ont compris. Vivera a été acheté par JBS aussi par exemple. Ils doivent avoir du revenu quelque part et ils se rendent compte que la viande n'est pas sustainable. On a besoin de grosses boîtes qui ont beaucoup d'argent pour investir dans le R&D et le marketing.’ Interview 14.

‘At the moment, all major multinationals go into this market and that is a threat like Unilever with the Vegetarian Butcher, or Nestlé. It has been put a lot of money into the market.’ Interview 7.

‘These new big players are communicating a lot on the products and that's why the category needs to be in balance between national brands and private brands.’ Interview 3.

Finally, one professional points out that the innovative products developed by these companies can then be used by retailers under their private label (2), which benefits the overall market for PBMS.

‘Unilever and Nestlé put a lot of money in that category. And that also helps my category, of course, because they do all the innovations. And for my private label products, it's typical that the retailer is waiting until a national brand is innovating. They set up a new product in the market and then our private label will copy it.’ Interview 1.

C.3.2.3 Social factors

According to the interviewees, big social trends are market drivers for PBMS. The majority of the interviewees consider that the social trend towards a flexitarian diet is one of the main drivers of the market (7).

Interesting to notice is that the majority of the interviewees consider flexitarians as the main target group for PBMS (10). As a consequence, they benefit from this growing social trend as their customer base is growing. The vegetarian or vegan trend is considered as too small to be a real driver of the market for PBMS (3).

‘(The growing flexitarian trend) - It has a huge impact because we target flexitarians so we don't target vegetarians or vegans because that range is too small in Belgium.’ Interview 1.

Mentioned social concerns driving the flexitarian trend are with regards to the environment (6), to their health (6) and/or to the animal welfare (4).

'I see 3 main reasons why people are eating more and more plant based: animal welfare, climate and environment, and health. As customers become more informed about the consequences of their food choice, some of them, although definitely not all, want to make changes. We see 2 big trends: people becoming 100% vegetarian or vegan, but also a lot of people become 'flexitarians', trying to incorporate more veggie meals 'part time'.' Interview 4.

In addition, according to several professionals, the COVID pandemic is also positive driver of the flexitarian trend, and therefore of the market for PBMS (3).

'Le switch est en train de s'accélérer avec tout ce qui se passe et la crise covid.' Interview 2.

'(La crise a apporté) un besoin de se repenser. Et je pense en tout cas avoir une prise de conscience envers pleins de sujets de façon plus large. Remettre un peu la planète et le bien être au delà de soi. Les problématiques environnementales et de santé, les gens vont y faire plus attention aujourd'hui.' Interview 2.

'Within the peak of Corona, the vegetarian category was one of the top seller categories together with pasta conserves and so on.' Interview 3.

On the contrary, consumers seem to increasingly expect healthy products which could be seen as a barrier for the market as it requires companies to adapt their strategies. Some interviewees mentioned the fact that consumers expect more transparency (3) especially on processed food (3), which has an impact on their promotion (3) or on their product composition (2).

'Un frein que je vois c'est de voir si les consommateurs seront toujours à l'aise (prêt à acheter) du fait d'avoir des produits très travaillés.' Interview 2.

'Le marché de masse, ça lui importe ce qu'il met dans la bouche, il n'est pas prêt à goûter des substituts végétaux qui ont un goût de viande si dedans il y a plein de merdes, quoi. Et du coup, pour le marché, en fait effectivement, c'est important parce qu'on se rend compte qu'il y a plus d'attente (et qu'il faut adapter les produits).' Interview 10.

'At the same time, the health aspect is also one of the main reasons, which is nowadays also top of mind for the customers, but also for retailers (...). You can see the example of our quality strategy with Nutri Score A & B on the products, which is also very visible within the vegetarian range.' Interview 3.

Interviewees also mentioned the fact that consumers' trend towards more transparency on the composition of the products, mixed with their growing concern for the environment can impact companies' sourcing of raw materials or perceptions of the product composition (3). It is perceived as an external barrier.

'Soy becomes more and more difficult to use because of the negative connotation.' Interview 1.

'Il y a beaucoup de confusion sur la provenance nos produits, notamment lorsqu'ils sont à base de soja, avec des reproches de détruire les écosystèmes en Amérique Latine, alors que nos produits sont essentiellement à base de soja européen.' Interview 5.

'The trouble is that with the fast-growing market, raw material supply will be more and more difficult, and we will sometimes be out of stock about some ingredients and this full transparency makes you less flexible, flexible to source.' Interview 7.

Finally, some interviewees mentioned the cultural differences between Walloons and Flemish regions in Belgium (2).

'On observe aussi que les substituts sont consommés davantage en Flandre et aux Pays-Bas qu'en Wallonie ou en France par exemple.' Interview 5.

'Dutch speaking people are expecting more assortment in the range, and the French speaking people, they are expecting healthier products, with a nutriscore A or B.' Interview 1.

'La France est encore pire que la Belgique, mais je pense que c'est lié à la tradition de culture. La France c'est beurre, crème, viande dans tous les repas et en Belgique c'est quand même surtout le sud c'est plus comme la France en termes de nourriture.' Interview 14.

C.3.2.4 Technological factors

In terms of technological factors, interviewees pointed out the differences between the existing technology, and the future technology with its potential offer.

Existing technology

Some interviewees consider that the current level of technology stimulates the market (4).

'I think innovation is the main driver of the market. 10 years ago, a plant-based hamburger was not similar in flavors as the original. At the moment, it is difficult to notice the difference.' Interview 7.

According to one interviewee, the existing technology allows any company, in terms of costs and availability, to create their own PBMS brand (1). However, the competition will be tough as everyone will produce the same products (1).

‘La concurrence est très rude sur les produits type haché, parce qu’aujourd’hui tu veux créer une marque de produits style steak haché, boulettes, saucisses. C’est très facile. Soit tu as des acteurs qui te font ça en marque blanche et tu as des dizaines d’usines qui peuvent produire ça à bas coût, parce que des extrudeuses sont très disponibles car elles sont utilisées depuis 50,60 ans pour faire des céréales, pour faire de la pet food.’ Interview 10.

In fact, the available technology to produce plant-based burgers, sausages or mince is at a mature level (3). One interviewee pointed out that the available technology to produce PBMS relied mainly on extrusion (1).

‘For some products, it’s at the maturity level. For example, the burgers, the sausages or the mince products.’ Interview 1.

‘Sur le marché aujourd’hui tu as énormément de produits hachés, donc des steaks pour burger, des saucisses, des boulettes de viande ainsi de suite. Tout le monde a deux ou trois exceptions près dans le monde entier, utilise les mêmes technologies pour créer ses substituts de viande. Cette technologie c’est l’extrusion, et l’extrusion permet de très bien créer des produits hachés, de créer des petits morceaux fibreux pour faire du poulet, par exemple. Mais ça ne permet pas de créer de grandes pièces avec ces structures complexes. Donc une entrecôte, tout ça on est encore très très loin dans le végétal.’ Interview 10.

Future technology

The discussion with professionals and experts leads us to analyze the potential new technologies, and how they could further drive the market.

In fact, most of the respondents consider that the current level of technology is not advanced enough, there is still room for further technological advancements (5), because the quality of current PBMS is not perfect (2).

‘Sur le plan technologique aujourd’hui, on est limité et il y a plein de choses qu’on ne sait pas faire. Donc, en fait, il y a énormément d’espace pour les innovations technologiques.’ Interview 10.

‘Research and innovation is essential. There’s still a long way to go in making those products as delicious as animal products. We have some burgers now, maybe some nuggets that are close to the animal product, but they’re not quite there. And we have a lot of product categories where we are just not there yet. There is no plant-based steak that really tastes like a normal steak.’ Interview 12.

'So, like some of the technology does exist, but a lot of it is still in development. And a lot of the startups you'll see will be investigating some of these new technologies.' Interview 13.

'There's so much new technological development in the plant-based world that's moving towards things that are actually better mimics of meat, both textural and flavor wise. You can even nutritionally match it or make it better.' Interview 13.

There are still many opportunities to develop new products for companies that are innovative and use other technologies than extrusion (4). One of these technologies mentioned by a professional is texturation (1).

'Une technologie de texturation des protéines végétales permet en fait de recréer ces textures un peu plus complexes, un peu moins anarchiques on va dire qu'un steak haché. Typiquement, cela part d'ingrédients super simples comme des protéines, de l'eau et du sel. Et avec ça, il est possible de créer des longues fibres, de la viande et recréer les structures complexes d'un blanc de poulet. C'est une alternative à l'extrusion.' Interview 10.

Another one is fermentation (3), highlighted by several interviewees as a technology that is used by more and more companies to either improve their products or create new products.

'Using fermentation to transform the ingredients are things like a bean and stuff and transform them into something that has more flavor and different textures. So that's a new technology that I think will basically appeal to consumers and that it's like a bit more natural, less processed, using more whole ingredients.' Interview 13.

'Quorn is the only one that has been doing this for a long time, with mushrooms. That's fermented mushroom mycelium. Quorn has really been the pioneer and it's only really in the last three, four, five years that other companies have been doing the same.' Interview 12.

Furthermore, some interviewees mentioned the fact that crop optimization could allow the use of various sources of PRPs or leguminous plants as raw materials for PBMS (2), leading therefore to new market opportunities. These raw materials are not yet optimized with regard to their taste (1), or their production process (1). More research is therefore needed.

'Crop optimisation is one area where a lot of progress can be made because so far most of the plant-based meat products on the market are based on soy and on wheat. And that's just because those are the cheapest crops to grow and then you use the protein and create a plant-based meat product.' Interview 12.

‘There are a huge variety of crops from peas, from fava beans, from other legumes, lentils that could be optimised to serve as ingredients for plant-based meats. So far, they have not been. There are problems, they don't actually taste very good. You have to like to do a lot of processing to get the bitter taste out of these crops to make it palatable for plant-based products. And there's a lot of research that could be done at the very basic level to optimise those crops for plant-based meat production.’ Interview 12.

‘Jusqu'à maintenant, sur les besoins en matière de protéines et tout particulièrement de légumineuses, l'Union européenne, on se heurtait toujours à des rendements relativement peu stables, une sensibilité aux maladies relativement importantes et enfin un rendement économique qui était nettement moindre que le reste.’ Interview 11.

According to some interviewees certain universities are currently working on research projects related to PRPs (3). This is considered as a market driver since they are improving the current level of available technology.

‘Many big universities have at the moment a program around plant-based. For example, Wageningen, but also Ghent in Belgium is doing a lot and also in other parts of the world. That will drive the market to make and to give you the potential to make the products better.’ Interview 7.

‘Il y a énormément de projets de recherches notamment basés dans certaines universités en Belgique. On a un peu de retard cependant par rapport à la Hollande notamment. Sur la Clean Meat (viande cultivée) et la fermentation par exemple.’ Interview 5.

Finally, the emergence of cultured meat is not considered as a threat by most of the professionals we interviewed (6). They also believe that it will take some time before it is available in Europe at an affordable price (4).

‘La viande cellulaire, ça va, ça va assez vite. Honnêtement, si tu m'avais demandé il y a un an, je n'aurais jamais pensé que Singapour, ça commençait à exister, mais on n'y est pas encore parce qu'il y a des grosses questions. Ça coûte quand même 10 fois trop cher et ces produits là il faut qu'ils passent quand même tout le Novel Food en Union européenne.’ Interview 10.

‘On pense que cela est positif et qu'on peut se développer en parallèle. Elle va mettre aussi un petit bout de temps avant d'arriver sur le marché.’ Interview 5.

C.3.2.5 Environmental factors

The environmental impact of meat is considered as a driver of the market for PBMS, as these products considered as more eco-friendly than meat by several interviewees (4).

‘On connaît tous l’impact de la viande sur le monde, que ce soit sur le plan de l’environnement. On parle de 14,5 pour cent des émissions de CO2, mais avec des estimations qui sont plus autour des 20-25%.’ Interview 10.

‘There is also a CO2 reduction that is allowed a lot if you produce plant-based. The amount of ground you use, the amount of water you use, yes. They are certain. The main concern about plant-based is on the food kilometers you are making for the raw materials.’ Interview 7.

Another interviewee considers that at a certain point, everyone will have to switch to plant-based diet because our planet’s resources are limited (1).

‘We saw that with the need of protein, with a growing population in the world, the planet is basically too small to continue to fill all those people with just animal proteins.’ Interview 9.

C.3.3 Marketing Mix

After having discussed the external factors with the professionals and experts, the discussion continued on the different marketing strategies that were undertaken or should be implemented by companies and by the sector as a whole in order make the market grow.

Interviewees mentioned strategies they were currently working on or planning to work on, and strategies they consider as interesting to implement in the future.

The framework 4PS - Price, Place, Promotion and Product - was presented to the interviewees. And we will analyze the results point by point. Moreover, product development strategies, will be analyzed under the ‘Product’ part of the 4Ps.

C.3.3.1 Price

Reducing the prices of their products is part of the strategy in most companies we interviewed (5). The objective is to increase sales of PBMS by offering more attractive prices for a big number of customers.

‘If you want to stimulate customers to eat more and more vegetarian food, then the price needs to be lower in the future.’ Interview 1.

‘Plant based should not be more expensive than meat, because that is also often named as a reason not to go plant based by customers.’ Interview 4.

'If you really want to reach out to the masses then pricing in the future will be more important because there's still a lot of consumers that are not buying the product because it's too expensive.' Interview 6

On the contrary, some interviewees expect clear measures from the political institutions. They may try to reduce their prices, but expect political decisions that lead to rising prices for meat in the future (2).

'I think meat is still too cheap due to the subsidies they get in Europe. And that makes that plant-based is probably too expensive. We should not have a meat tax, but a mark-over on price, a fair competition.' Interview 7.

'In the end, I also believe that the price point of meat is too low. So, it's not only that plant-based food has to go down, but meat also has to go up.' Interview 9.

C.3.3.2 Place

The brands we interviewed all sell their PBMS through retailers. It was therefore assumed that it had been their strategy beforehand to have retailers as a distribution channel in order to sell to the general public. No additional data were collected on the reasons for such a choice.

However, the strategy with regard to shelf space in the supermarkets must be analyzed as it was mentioned many times during the interviews. According to several interviewees working for brands, PBMS should be sold next to meat products at all the retailers to facilitate the trial purchase of omnivores and flexitarians (5).

'It's important to make sure that in supermarkets, plant based meat products, are not necessarily like in a niche corner somewhere in the back end, like the veggie corner, but actually sold next to conventional meat products so that the people who are used to eating meat or who like meat, have an easier time actually looking at it and seeing like, 'hey, this looks like something I would want to try' and then going away and trying it.' Interview 12.

'Pour toucher ces consommateurs, que moi j'appelle les opportunistes, ils ne sont pas convaincus, mais ils sont curieux. Je prends l'exemple du nuggets, mais si tu mets ton nuggets végétal en face de la marque classique qui est du vrai poulet, tu auras plus de chance d'être vus et donc achetés par ces consommateurs opportunistes, que si tu viens les placer dans un rayon végétal bio exclusivement réservé entre guillemets aux personnes qui sont sensibles au végétal ou bio.' Interview 2.

Based on our interviewees, it seems that several retailers are also in line with this strategy (3), even though they will not always put the products next to each other, but rather near the meat products in one specific place (1).

‘L’emplacement et l’implantation en magasin va être un élément décisif pour transformer l’achat et faire en sorte que l’offre soit visible et au bon endroit. Ça c’est tout une stratégie de marque, mais surtout d’enseignes distributeur puisque c’est nous qui avons la main là dessus, et aujourd’hui notre stratégie est de s’implanter dans le rayon conventionnel, d’être visible et ne pas louper de ventes.’ Interview 2.

‘Our range of vegetarian alternatives will always stay one range apart, but it’s always in our stores placed in the near future of the meat section or the poultry section or the fish section.’ Interview 3.

Moreover, several professionals expect the retailers to reduce their range of meat products and increase the number of products in the vegetarian range, including the PBMS (4).

‘I think in the future that each retailer will delist a lot of meat products for vegetarian products. And not only my assortment, but also the plant- based assortments.’ Interview 1.

‘We are looking right now in the stores to enlarge the space that is dedicated to vegetarian alternatives.’ Interview 3.

‘What Albert Hein is doing in Holland, it’s really supporting the market by giving us more and more shelf space in the supermarket.’ Interview 7.

However, it is not so easy for retailers to do so, as they have to offer a solution for all customers (1).

‘We are, of course, a retailer and we want to offer a solution for all customers. And we will always have customers who want us to keep eating meat. It’s not possible to say from one day to another in a store ‘okay we will cut some products in meats or in poultry and replace it by veggie’ it’s a lot more behind it.’ Interview 3.

In addition, other distribution channels than retailers were suggested by the interviewees in order to make the overall market for PBMS grow. In fact, interviewees mentioned selling PBMS in restaurants (2), festivals (1), food service (3) and institutional catering (2).

‘Je crois que les restaurants et festivals sont très importants parce qu’on est en contact avec notre client final, qu’on fait tester aussi de nouveaux produits.’ Interview 5

‘Tout ce qui est cantine scolaire, cantine d'entreprise. Les substituts doivent s'aligner avec assez peu de marge de manœuvre sur des prix très faibles de la viande dans ces cantines. Donc clairement, lorsque les prix permettront, ce sera un gros gros marché qui s'ouvrira pour tout le monde.’ Interview 10.

‘Foodservice, c'est-à-dire des produits qu'on distribue par les grossistes les plus importants en Belgique, vers des grandes cuisines, des chaînes de restaurants, en plus grand volume, congelés.’ Interview 5.

C.3.3.3 Promotion

In regards to promotion, different promotion strategies were mentioned by interviewees in order to raise awareness on these new products and encourage consumers to try and purchase them.

‘In order to get acceptance of a product by a group, promotion is very important.’ Interview 9.

Two interviewees mentioned that retailers offer discounts on PBMS to consumers once a week (2).

‘We try to convince them with our promotion strategy, for example, almost every week you can find at least one vegetarian alternative that is in promotion.’ Interview 3.

Regarding the message, our discussions pointed out the fact that consumers need to understand better how to prepare and consume such products (2). Several interviewees mentioned that it was part of their communication strategy to provide recipes or information in order to educate consumers (4), which can also be done via influencers or partnerships.

‘We integrate (PBMS) more and more in the picture. If we are, for example, working with recipes, we always have the vegetarian alternative next to it.’ Interview 3.

‘(One of our brands) had a partnership with Food Bag. So Food Bag is one of the new meal boxes that you see. And there they had a full veggie food bag during this month to show the customers how you can try vegetarian recipes that are also good.’ Interview 3.

‘We are working with a certain range of influencers. So sometimes at the launch of new products, they receive some packets with which they can try some recipes. And then, of course, they have to post it on Instagram or others. But our national brands, suppliers, they are sometimes doing the same, the same thing.’ Interview 3.

Finally, several interviewees mentioned the importance of tastings in retailers, as a way to encourage consumers to try PBMS for free, and purchase it for the first time if they like it (3). This was also adapted to the Covid-19 pandemic.

‘So tastings it's very important for veggie because people need to be convinced that is good, for example (one of our brand), they have their food truck, on the parking of shops where they let try to taste the products to customers. So we hope that from 2022, we will be able to do it.’ Interview 3.

‘It's on the plan that if tasting is allowed again, then we will also do tastings with the vegetarian components. We also did a free sampling in collect and go.’ Interview 1.

C.3.3.4 Product

Based on the interviews, this section will provide more detail with regard to our last research question, and will therefore be more detailed than the previous three points of the marketing mix. First, we will analyze present products' development strategies. Then, new product development strategies will be presented.

C.3.3.4.1 Improvements of present products

Interviewees pointed out that product development was essential in order to improve the present products on three aspects: health benefits, quality of the sensorial aspects, and carbon footprint (10).

In fact, based on their answers, it becomes clear that they put emphasis on making the products healthier and less processed (6).

‘National brands are putting a lot of money in it to make their products also healthier.’ Interview 1.

‘Quand tu rentres dans un supermarché, comme tu le dis, il y a énormément de produits qui sont bourrés d'additifs. Donc, il y a des innovations à faire sur comment tu fais pour réduire le nombre d'ingrédients et pour avoir des ingrédients qui ne sont pas controversés dans tes produits.’ Interview 10.

‘A lot of the typical meat replacements are not the healthiest –a lot of cheese, salt, fat. So, I also think there should be a focus on making less ‘processed’, healthier meat replacement products.’ Interview 4.

Moreover, some interviewees mentioned their focus on improving the quality of sensorial aspects and especially the taste of the products (6).

‘En terme de qualité de produits quand on voit globalement le retour des clients sur beaucoup de produits, ils ne sont pas super bons, donc il y a aussi vraiment de la marge là dessus.’ Interview 10.

‘L’objectif, c’est de travailler sur plus de qualité, évidemment, pour répondre aux attentes de goûts qui sont forts, tout en ayant le bon prix.’ Interview 2.

‘I guess that product improvements of plant-based meat substitutes will stay important, on the taste and on the look.’ Interview 3.

‘On fait souvent des versions 2 ou version 3 de certains produits. On cherche à s’améliorer autant au niveau de la valeur nutritive que du goût.’ Interview 8.

Finally, two interviewees mentioned a possibility in the future to improve the carbon footprint of PBMS (2).

‘The market is demanding for substitutes with local sourcing. And if the market is there, the options are there, the only question will be, can you show us the amount of raw materials you need local? Yes, or do they only have few products or do they need everything to be local?’ Interview 7.

‘Even for plant-based meats and plant-based foods, now people and all of a sudden companies are looking at like how do we make even more climate friendly products and processes? Because you’re still using resources like water, energy, there’s still are impacts.’ Interview 13.

Interesting to notice is the use of new raw materials, which was mentioned by some interviewees as a way to improve their present products towards something healthier and more sustainable (4).

‘There is a movement as well to find a way to work with different types of ingredients that have things like fava beans and see a lot of work with things like mushrooms.’ Interview 13.

‘Il y a encore des choses qui vont changer. Je pense que la protéine de pois va grandir, elle est intéressante parce qu’elle n’a pas d’allergènes et peut être produite localement.’ Interview 5.

‘I guess you see a lot of things like a pea protein like peas, chickpeas, and again, even some of the micro protein, you see more and more of that, which is the mushroom fungus mycelium stuff.’ Interview 13.

Moreover, the use of new raw materials can also be used in the development of new products.

C.3.3.4.1 Launch of new products

According to several interviewees, the market for plant-based burgers is saturated (5). As a consequence, product development does not seem necessary on new plant-based burgers, but is considered as essential for the range of PBMS in order to increase the sales (3).

'I think that the burger market is at the moment so big and the products are so good that there is no space, that there'll be a price market, they will compete on price now, and that's another market.' Interview 7.

'I think the biggest trend will be broadening the product portfolio.' Interview 9.

'En termes de gammes de produits, il y a clairement, l'innovation à faire pour élargir la gamme de produits et ne pas juste avoir des steaks végétaux.' Interview 10.

First, Interviewees mentioned the need for new meat-like products such as: bacon, chicken, porc, spare ribs (4), in order to broaden the product-portfolio of PBMS.

'I think that in the markets, no one was able yet to find the bacon alternative, for example, which really tastes and looks the same.' Interview 3.

'On va aussi vendre des produits à goût de porc. On regarde où est la demande et on cherche à sortir de nouveaux projets.' Interview 8.

'Same for the poultry reference also, the chicken-like products as well, I think that a lot of other introductions can be done.' Interview 3.

Different formats and options of present PBMS are also expected by some interviewees, in order to offer more diversity and choice (2), and widen the PBMS product portfolio.

'If you look at the first retailers that are starting with plant-based, they'll have a burger, they'll have a mince, and they might have a sausage or chicken piece, but if you look at the retailers that are already longer in it, you'll have a mince that is maybe already precooked or that already has a seasoning on it versus fresh looking mince, they have seasonal hamburgers. So that's more into the depth of the specific product.' Interview 9.

Moreover, non-meat like substitutes are pointed out by several interviewees in their future pipeline of new product developments (4).

'There seems to be more and more demand for plant-based products which are tasty and healthy, and do NOT imitate meat. So I think the offer in the future will become a lot more varied and creative.' Interview 4.

'Aujourd'hui il y a de nouveaux acteurs qui arrivent sur le marché et qui se positionnent moins en pure alternative, ça ressemble moins à de la viande. On est pas sur du faux steak ou du faux nuggets, ou émincé de poulet. Ce sont d'autres types d'idées sur lesquelles, nous on se positionne aussi parce qu'on pense que pour élargir la base d'acheteurs, c'est aussi important d'avoir ce type d'offres.' Interview 2.

'On the other side, there is variation to come up with other food which is also very tasteful and good but not a total substitute, as they will not be the same as the original. But just to come up with something different. Consumers, they look for it, but if you bring something, the group that really likes it and knows how to use it is sometimes too small.' Interview 7.

'You have to think about the vegetarians, they don't look for meat substitutes. In recent years, the focus was very hard on the meat alternatives. But I guess that's for all the other alternatives we also have to keep trying to find innovations.' Interview 3.

Finally, some interviewees consider that the market for PBMS is getting saturated (5). As a consequence, they think about developing new products for new markets: plant-based fish substitutes (4), or plant-based cheese (3) seem to be the future big innovation trends in the plant-based sector.

'Il n'y a pas que des substituts à la viande dans ces innovations. On commence à avoir une offre assez conséquente. Donc on va chercher de nouveaux relais de croissance sur d'autres segments moins matures.' Interview 2.

'Le poisson végétal c'est un marché qui est beaucoup moins mature que la viande. Mais il y a beaucoup de gens qui commencent à s'y intéresser. Dans 12-18 mois, on va commencer à voir des choses intéressantes.' Interview 10.

'And for fish, for example, fish analogues, as we are calling them there, a lot can be done. And I think that this is something that in the coming years will be top of mind.' Interview 1.

'Autrement, il y a aussi encore beaucoup d'innovations possibles pour les substituts aux fromages.' Interview 5.

'The cheese markets, the vegan cheese markets, it will be huge in the future I think.' Interview 1.

To conclude the analysis of these two product development strategies, namely the improvement of existing products and the launch of new products, it is interesting to analyze what interviewees told us

about the value proposition of their PBMS. The value proposition seems to be based on 3 aspects: a product that is similar to meat (5), especially in terms of taste (4), easy to use (3), and healthy (2).

‘We really focus to bring the best product that is as close as possible to the animal protein equivalence. And we look at the different aspects of the products. So not only focusing on taste and texture, the whole multi, multi sensorial aspects.’ Interview 6.

‘On trouve que le moyen le plus efficace ça reste de proposer des substituts qui ressemblent à de la viande.’ Interview 10.

‘On propose des produits qui sont vraiment goûteux parce qu’on pense que c’est vraiment le goût qui fait la différence et qui va attirer un plus grand public ou un public plus large vers notre type de produit.’ Interview 5.

‘Everything starts with taste and 95 percent of the products are bought because of the taste.’ Interview 6.

‘So our proposition is fresh meat like our products look, we try to make them taste but also cook identical to meat. Same cooking instructions, everything’ Interview 9.

‘It should still be quick and simple and not take too long to be in the kitchen.’ Interview 7.

Interviewees mentioned these aspects as being of primary importance and as being a driver for their strategies of product development.

As a conclusion, this analysis allowed us to have a better understanding of the impact of external factors on the market for PBMS. Moreover, different marketing strategies on price, place, promotion and product have been analyzed.

The interviews’ content of our two qualitative studies have now been respectively analyzed. Our interpretation of these analyses will be presented in the next section.

D. THEORETICAL LOOP

D.1 Discussion

The discussion will present a synthesis and interpretation of our results, and a theoretical loop to compare the later with what has been found in the literature. This is followed by the managerial recommendations in section D.2 resulting from the findings of our research. Finally, limitations and directions for future research will be presented in section D.3.

D.1.1 A proposal for the segmentation of young omnivores

First, the analysis of our results allows us to propose a segmentation of young omnivores with a high education level under 30 years of age, and living in urban areas. Indeed, young omnivores appear to differ in their current and future behavior in regards to meat consumption, which complements the literature review considering only the flexitarian as the main target group (Agrosynergie, 2018; Deloitte, 2019; Proveg, 2020b).

In fact, based on our analysis, four types of behavioral intentions can be distinguished in our interviews:

- 1° The omnivores who will not reduce their meat consumption.
- 2° The omnivores who will not reduce their consumption, but will adapt it towards more sustainable consumption patterns.
- 3° The omnivores who plan to reduce their meat consumption, and replace it with vegetarian dishes without PBMS.
- 4° The omnivores who plan to reduce their meat consumption, and replace it with PBMS. This group could then be considered as a potential target for PBMS.

This segmentation shows that some young omnivores could be interested in the consumption of PBMS.

D.1.2 An emerging decision-making process

By following the decision-making process proposed by Grunert & van Trijp (2014) (See Appendix 17), an emerging decision-making process to explain young omnivores' attitudes towards PBMS can be suggested.

Non-homogeneous values

First, it does not seem adequate to consider omnivores as a homogeneous group sharing the same values, which a few studies try to prove by comparing vegetarians' values to the rest of the population (Allen et al., 2000; Ruby, 2012).

It appears that young omnivores prioritize taste and thus can be considered hedonistic, which had also been proven by Kitsawad & Guinard (2014). In addition, the fact that they are attached to meat consumption, habits, and convenience may prove that they have traditional and security values as it had been proven by Kitsawad & Guinard, (2014) and Ruby (2012).

Moreover, the fact that some omnivores may integrate environmental or ethical criteria in reconsidering their meat consumption also proves that some may have universalist or benevolent values. This puts into perspective the Allen et al. (2000) and (Cliceri et al., 2018) findings that mention that these values were stronger for vegetarians and almost inexistent for omnivores.

Some omnivores might also be open to change as they consider reducing their meat consumption and changing their eating habits. However, some may not be interested in PBMS, and others would like these PBMS to look exactly like meat, which may show a kind of resistance to novelty, and thus a lower degree of openness to change. Different levels of stimulation are thus illustrated, and this may complement the findings of Hoek et al. (2011).

Different motivations and desired benefits

In regards to the 'want' formation of the decision-making process by Grunert & van Trijp (2014), young omnivores' desired benefits when purchasing food products, as well as their motivations have to be compared to infer results, which was not the case in the reviewed model.

In fact, it appears that young omnivores have more self-oriented motivations and desired benefits than other-oriented ones (See Table in section C.2.2) which was also suggested by Hoffman et al. (2013),

Lentz et al. (2018), and Mulee et al. (2017) in their study of omnivores' motivations and barriers to reduce meat consumption.

Our discussions on their potential motivations for reducing their meat consumption and consuming PBMS showed that most of the young omnivores might have environmental and ethical motivations. These motivations appear to be linked to the perceived disadvantages of consuming meat. Our research can then complement the findings of the study by Lentz et al. (2018) that considered only price and health aspects in the motivations of omnivores for reducing their meat consumption, and also those of Mulee et al. (2017) considering only health aspects and the discovery of new tastes. Indeed, in addition to these, the environmental and ethical impact of meat could also be considered as an important motivation, even for omnivores.

It is essential to point out that young omnivores' environmental and ethical motivations translate very little into their desired benefits when purchasing food products. This also complements the model of Grunert & van Trijp (2014) who considered that all motivations were translated into desired benefits, which does not seem to be the case for young omnivores.

If we focus on young omnivores who are ready to adapt or reduce their meat consumption, we can imagine that, in the future, new desired benefits could be added to the ones linked to their current purchasing criteria as they confirm their intention to change their eating habits and meat intake.

After interpreting values and motivations, we should now interpret omnivores' perceptions of the attributes of PBMS currently available in the market. These perceptions are related to the inference formation stage of Grunert & van Trijp's (2014) model, as they will infer product benefits or product barriers.

Different perceptions, product benefits and product barriers

In regards to the 'inference formation' of the model of Grunert & van Trijp (2014), young omnivores do not have all the same perceptions of PBMS.

A table in Appendix 30 provides a summary of young omnivores' product-related perceptions. We have classified them into either inferred product benefits or product barriers, as presented in the model of Grunert & van Trijp (2014). The table also mentions the findings of the literature review on perceptions of PBMS and highlights if our results are in line or different. The literature was sparse on the perceptions, our results can thus provide more information or indicate directions for future research.

The following summary table can illustrate our results and interpretation.

Motivations	Desired benefits	Product benefits	Product barriers
in yellow: young omnivores' motivations	in yellow: young omnivores' main desired benefits	→ inferred from young omnivores' perceptions	→ inferred from young omnivores' perceptions.
Please myself	Taste	Mismatch	x
Please myself	Familiar visual aspects	x	x
Buy something I can cook easily, and that I know	Convenience	x	x
Don't overspend	Price	Mismatch	x
Have an healthy lifestyle	Health	x	x
Save the planet	Sustainability	x	
Save the animals	Animal welfare	x	

Potential reasons behind young omnivores' negative attitudes

A potential mismatch is shown between young omnivores' desired benefits, and the benefits they inferred from PBMS (white boxes in the product benefits column). In fact, even though young omnivores infer some benefits from PBMS (in green in the table), it seems that these benefits do not

match their most important desired benefits (in yellow in the table), as they are not considered as regular consumers of PBMS.

These findings follow the logic of the decision-making process of Grunert & van Trijp (2014), stating that *'consumer's willingness to try and keep buying the product is related to the extent to which the product benefits that consumers infer from a new product will have matches with the benefits that they desire'* (Grunert & van Trijp, 2014).

It seems legitimate to ask whether young omnivores will not prioritize certain desired benefits sought by food products. Price and taste seem to be their main desired benefits. In fact, it appears that PBMS can be perceived by young omnivores as more environmentally and ethically friendly products than meat, and they see this as benefits of the product. However, at the same time these products can be perceived as too expensive or not tasty enough which will negatively affect their intention to buy these products, and lead to a negative attitude, even though they had mentioned the environment and animal welfare in their motives.

This finding qualifies what Hoek et al (2011) found in his study. Indeed, the authors considered that omnivores would recognize the positive aspects of substitutes for the environment, but that they would not consume them because they did not have motivations towards the environment. In fact, they can have motivations but they lack the translation of the latter into their desired benefits.

Moreover, young omnivores can perceive PBMS as a convenient, healthy, and familiar product. However, these attributes seem to be considered as secondary desired benefits by young omnivores, since they do not lead to a regular purchase of such products. Young omnivores can also perceive these attributes negatively which could also explain their attitudes towards PBMS.

A potential solution

Remaining product barriers can be removed and changed into product benefits that fit young omnivores' desired benefits. There seems to be 2 major product barriers, i.e price and taste, and 2 secondary ones, i.e health aspects and convenience. Young omnivores could be convinced, first by

better sensorial aspects, and better price, then by more information on how to integrate such products, and more transparency on the level of processing. New technology features, product features or marketing features, according to three aspects influencing consumers' perceptions (Grunert & van Trijp's, 2014), could help removed these barriers.

These findings can be compared to the study of Slade (2018), who found that if both the taste and price of meat and PBMS were equivalent, a majority would continue to buy conventional meat products. It raises questions on the level of taste and price, as well as on the role played by health and convenience benefits. Some recommendations will be provided in the next section.

Trial intentions

Young omnivores seem to have preferences for certain types of PBMS, and for certain situations in order to try and consume them.

Michel et al. (2021) and (Hoek et al., 2011) found that omnivores indicated a preference for a PBMS to look like meat, which is in line with part of our findings. However, some young omnivores also indicated a preference for PBMS to not look like meat, which can be explained by their strong attachment to meat, as well as a preference for less processed PBMS.

Furthermore, differences exist between appropriate situations for trying or consuming the product. In fact, PBMS can be perceived by young omnivores as more convenient to consume in casual situations and less appropriate in formal situations when social pressure is likely to be present, which was also found by Michel et al. (2021).

However, the social environment composed of young omnivores' friends seems to play a major role for facilitating situations for trying PBMS. This was also mentioned by Funk et al. (2020) in their study on the importance of role modelling. Our results can also complement the literature as they highlight the importance for young omnivores of having PBMS available in restaurants, tastings and discounts in the supermarkets, in order to facilitate situations for trying PBMS.

To conclude this section, we believe companies can draw inspiration from the analysis and the discussion in order to develop strategies and specific products to target young omnivores willing to reduce their meat consumption. This leads us to managerial recommendations in section D.2.

D.1.3 External factors with a growing influence on the market

Based on the summary table of our analysis in Appendix 31, five different marketing strategies seem to be impacted positively or negatively by external factors. These strategies can be ordered in the following chronological sequence to convert consumers into customers of PBMS:

- Increase consumers' interest in reducing their meat consumption,
- Increase consumer awareness of PBMS,
- Position PBMS as a convenient way to substitute meat,
- Offer a lower price than meat to make PBMS more attractive and affordable,
- Offer qualitative products via product development to increase sales, and consumer retention.

As said by Yüksel (2012) the external environment can provide proper conditions to achieve specific strategies. However, it seems that it can also act as a barrier. We can demonstrate which external factors act as drivers or barriers to the five strategies, while confronting this with previous findings of the literature review.

Positive impact on consumer interest in meat reduction

Growing social concerns about the impact of meat consumption on the environment, on animal welfare and health seem to be the main explanation for the shift towards a flexitarian diet. Having these concerns is considered by professionals as the first step towards consuming PBMS, which is in line with the studies of Deloitte (2019) and the European Commission (2018) considering that the flexitarian trend is a market driver for PBMS.

In addition, NGOs, associations, media, governments and institutions communicate more and more about the benefits of a plant-based diet, encouraging consumers to reduce their meat consumption. The Deloitte (2019) and CSS (2019) studies had also assumed such an impact.

Positive impact on consumer awareness of PBMS

Retailers act as market drivers as they offer more and more space to PBMS on their shelves, which increases consumer awareness of PBMS, which is in line with the findings of studies by Deloitte (2019), the European Commission (2018) and Geijer & Gammoudy (2020).

In addition to the impact of retailers, it also appears that food industry giants are now investing in the market and communicating about their new PBMS since they have substantial marketing resources. This will act as a market driver, as it will increase consumers' exposure to these products.

These findings also complement the theory of Grunert & van Trijp (2014) who considered that a competitive environment will be beneficial, as the perception of certain products may change as a result of the introduction of new products by new players.

Negative impact on the positioning

The policy measures on labelling and packaging of PBMS could negatively impact the positioning of the PBMS, as companies will no longer be able to sell them as meat substitutes, and these products will have to differentiate themselves through their name and packaging and create their own identity. This confirms the hypothesis posed by Leialohilani & de Boer (2020) on a possible impact of this European legislation. Although the legislative project was cancelled on the European level, each EU member state can still implement those restrictions on a national level.

Companies consider that consumers might then find it more difficult to understand the purpose of these new products and would buy less PBMS. This is in line with the theory of Domke (2018), stating that food labelling can influence and guide the consumers' purchase and consumption decisions.

Positive and negative impact on price

Two external factors can have a positive and negative effect on the strategy of making PBMS available at a lower price than conventional meat products. Firstly, European subsidies to the meat industry make it difficult for meat substitutes to adjust to such low prices, which was also mentioned by Kateman (2021) and Stoll-Kleemann & Schmidt (2017) in their respective studies.

On the other hand, the Belgian and European policies to produce more protein-rich plants (PRPs) locally will increase the supply of PRPs, thus decreasing the price of the raw materials needed to produce PBMS and therefore the price of PBMS.

Positive and negative impact on product development

Finally, several external factors have a negative or positive impact on product development strategies: Novel Food Act, European and national R&D policies and consumer expectations.

First, it seems that the European Novel Food legislation is holding back product development due to its complexity and the time and effort it requires to go through the process. This qualifies the finding of Grunert & van Trijp (2014) mentioning that food laws could act as a driver for product development.

On the other hand, the EU is also funding R&D to develop new open source food technologies that could be used in future product developments to offer better PBMS to consumers. Universities and companies will be able to benefit from these EU funds, as also illustrated in the Walloon strategic plan for PRPs production in Belgium (SoCoPro et al., 2018). This will act as a major driver as the existing level of technology appears to be limited to accelerate the market, which is in line with Kyriakopoulou et al. (2019), stating that continuous R&D at a global level on the production of PBMS was expected to offer further growth opportunities.

Finally, professionals are currently developing new PBMS with 'cleaner' compositions, or the use of locally sourced raw materials. This seems to be the consequence of the fact that consumers expect more transparency on PBMS, which was suggested also by Kyriakopoulou et al. (2019), and shows that new consumer expectations could influence product development strategies.

To conclude, it appears that the external environment presents opportunities and threats for the market of PBMS, and especially in regards to different marketing strategies. Companies could act upon it, and we will provide some managerial recommendations on the later in section D.2.

D.1.4 Relative importance of product development strategies

Although identified by Deloitte (2019) and He et al. (2020) as essential to the growth of the market for PBMS, it appears that product development will not be the only focus of companies in their marketing strategy. In fact, companies seem to consider each one of the 4Ps of the marketing mix (Baker, 2014).

Price

As found in the literature by Geijer & Gammoudy (2020), there is a trend towards a strategy of reducing the prices of PBMS in order to make them affordable for everyone. This pricing strategy for substitutes can be considered a *penetration strategy* as presented by Singh (2012).

Place

The strategies with regard to distribution channels are related to what Deloitte (2019) mentioned in their report, namely the importance of selling PBMS at the most important retail stores. Furthermore, the strategy of placing its products at retailers appear to be of high importance for companies, and it appears that both the brands and the retailers would opt for a placement of PBMS on supermarket shelves as close as possible to the conventional meat products. This strategy could facilitate the purchase of these new products.

To complement the literature on the strategies related to place, wholesale also appears to be a strategic distribution channel for PBMS, and more specifically for private label producers. Other channels could be restaurants, festivals, and institutional catering, which can be added to the list provided by Singh (2012).

Promotion

Discounts, advertisements, influencers' campaigns, and tastings are the four promotion instruments used by marketing professionals. They fall into categories of personal communication (e.g. tastings and influencers) or more impersonal communication (e.g. discounts or advertisements), as intended by Baker (2014) in his definition of an effective communication strategy.

Beyond increasing consumer awareness of PBMS, which was recommended by He et al. (2020), promotion strategies also focus on facilitating the first experience with PBMS and on reducing the perceived high level of effort to consume PBMS.

Product

As different market players are developing new or improving existing products, and that their target group do not change, i.e. flexitarians, it appears that strategies of product development are implemented, if we refer to the definition given by Ansoff (1957): '*new products for present markets*'.

Product development seems to be implemented primarily towards *improving existing products*, mainly in terms of health benefits and sensory aspects. Companies want to improve the benefits of their existing products in order to increase the acceptance of these products, and thus their sales, which is in line with the findings of Geijer & Gammoudy (2020), He et al. (2020), Hoek et al. (2011), and Michel et al. (2021).

Secondly, players seem to be looking at launching new products, which could increase the market share of the PBMS product range. It is important to differentiate the following sub-strategies.

First, companies are looking at launching new products to *cover the whole range of conventional meat* products, which was also recommended by Geijer & Gammoudy (2020), and using also new food technology such as extrusion. Then, to complement the study of Geijer & Gammoudy (2020), some companies are also working on *diverse options within the current range of "classics"* such as burgers, sausages, nuggets and mince. As the market for these products is perceived to be saturated, a product development strategy with new flavors or formats can be used to offer more diversity.

Finally, it seems that some companies also target consumers who are not attracted by meat-like attributes, and are developing *new PBMS that have no similarity to meat*, except for the shape and nutritional content. However, it seems that these new products target more vegetarians and vegans than flexitarians. This strategy could then be part of a diversification logic according to the Ansoff (1957): '*new products for a new market*'.

In parallel, these companies are also ready to launch plant-based substitutes for other categories such as fish and vegetable cheese, which can also be considered as a product development strategy according to the definition of Ansoff (1957).

To conclude on marketing strategies, several growth strategies are implemented at the same time, namely **market penetration**, i.e increasing sales of existing products in existing markets, and **product development**, i.e developing new products for existing markets, based on the Ansoff matrix (1957).

First, a *penetration strategy* is implemented by brands and retailers to increase the market share of their existing PBMS towards flexitarians. In order to do so, they invest a lot in different promotion tools, use retailers as distribution channels, and aim to offer lower prices. At the same time, *product development* seems to play a very important role as they keep improving their existing products, and they develop new products towards flexitarians.

Managerial recommendations on each one of the 4Ps will be provided in the following section.

D.2 Managerial recommendations

The managerial recommendations are based on our global understanding of the market for plant-based meat substitutes (PBMS) after having studied it via several axes: demand-side, supply-side, and external-side. These recommendations are appropriate in a logic of mainstreaming the products and making them attractive and accessible to the masses, and in particular towards the young omnivores whose specific expectations we explored.

These recommendations are intended for companies active in the market. They can benefit from them in order to increase their sales, and therefore increase the market shares of PBMS.

D.2.1 Keep improving and developing new plant-based meat substitutes

First, it is essential to continue to improve the taste and other sensorial aspects. Two types of strategies can be implemented, i.e. offering meat-like substitutes, and others that are not similar to meat.

The strategy on taste is essential because for many consumers the first experience is decisive. Indeed, if they make the effort to taste a product they don't know, and if they don't like it, they could have a negative opinion on the whole range of PBMS and this would greatly slow down the chances of convert them in regular customers of PBMS.

In addition, in order to meet new consumer demands on health benefits, PBMS should be as clean as possible, with as many natural ingredients as possible.

The launch of new products is also essential, in order to complete the range of PBMS that do not yet exist, and to offer more choice to the consumer, beyond the classic products (burgers, minced meat, sausages, nuggets). Furthermore, Belgian companies should be inspired by what is being done in more mature geographical markets. For example, one type of product that deserves more consideration is the 'charcuterie', which is very developed in Germany, the Netherlands and the UK. It is an interesting product, especially for young people who often eat quick meals.

In order to improve existing products or to develop new products, companies should invest in their own technology or source better technology from different private label producers. It is also important that they consider opportunities in their environment, such as specific research funds from the EU, university projects that are working on improving these products, or by continuing to analyze the competition and what is being launched in the market.

D.2.2 Reduce the prices

In addition, the price of PBMS will need to be reduced to make these products attractive to the general public. Some consumers will compare these alternatives to meat, so the most effective strategy would be to position them below meat.

In order to reduce these prices, an increase in production capacity is recommended, as well as increasing pressure on policies. Indeed, more and more pro-PBMS organizations exist to put pressure on future policy measures in order to reduce subsidies to livestock, or to provide more financial support for PBMS producers.

Before reaching this price level, a discount strategy is recommended as it allows consumers who find substitutes too expensive to try them, to potentially have a good first experience, and then to buy them again even though they are more expensive.

D.2.3 Get retailers on board

The following recommendations are intended for brands exclusively.

In order to reach a maximum of consumers, it is also necessary to continue to make PBMS more present and visible in supermarkets. Indeed, the ideal would be to have them placed next to the meat so that the consumer can easily switch. It is therefore essential for the brands to continue to negotiate and collaborate with the largest retailers.

It is also recommended to distribute PBMS in restaurants, in order to encourage consumers to try them, and potentially adopt them afterwards. The advantage of restaurants is that they can showcase PBMS and give the consumer ideas on how to use these products in their everyday life.

In addition, it is recommended to brands to lookout for opportunities in their external environment. As an example, new growing trend has recently emerged; dark stores that deliver your groceries directly to your home. A strategy of selling substitutes through these channels could also be interesting.

D.2.4 Keep improving and developing new plant-based meat substitutes

In order to encourage the testing of PBMS, tastings are very important and can be set up directly in supermarkets, or via free samples.

At the same time, a communication work is necessary. Indeed, given the new character of these products, the average consumer does not always know how to use them. It is therefore recommended to provide them with recipes, or ways to easily integrate them into their routine. Partnerships with companies offering meal boxes and recipes are also recommended.

Finally, it is also recommended to make these PBMS more transparent regarding their degree of processing, their composition and their environmental impact. Indeed, flexitarian consumers and omnivores wishing to reduce their meat consumption are acting on concerns about their health and the environment. It could be that in the long run they will ask more and more information on these aspects from the companies.

To conclude, we recommend that market players consider each of the 4 points of the marketing mix as essential to their growth. In order to develop the best strategies, it is also important to take into account the needs of consumers, as well as the opportunities in the external environment.

The distribution channels, pricing and promotion strategies will allow average consumers to consider more and more these products until they decide to test them and eventually adopt them. Then comes the product strategy, which must meet consumers' expectations on sensory aspects and convenience so that they become regular customers.

D.3 Limitations & directions for future research

Although our research is encouraging in terms of the results obtained, some limitations must be considered. This section outlines the main ones.

D.3.1 Subjectivity and qualitative study.

Subjectivity

Firstly, the qualitative nature of our research implies a certain amount of subjectivity on the part of the researcher in the interpretation of the data collected, particularly in the allocation of verbatims between the different categories.

In addition, it seems important to mention that the researcher is himself a vegetarian, and that this could have played a role in the interpretation of the data.

Qualitative study

Moreover, by definition qualitative studies do not allow for generalization of the results that were obtained and the conclusions that were drawn (Jolibert & Jourdan, 2006). In order to generalize the results, a quantitative research, using some of our results as hypotheses, can be conducted towards consumers and professionals.

For example, after confirmation of our results by a quantitative analysis, future research could be undertaken on the decision-making process of flexitarians with respect to PBMS in order to be able to compare our results and identify the factors that make them consume more PBMS than omnivores.

It also seems relevant to confirm the impact of potential external factors on marketing strategies, whether for the market of PBMS, or for another market in the food industry. Since, for example, the Novel Food Act does not only apply only to the market for PBMS, it would be interesting to conduct a study of the impact of this policy on the marketing of other food companies.

In addition, it would be interesting to conduct a quantitative study with each type of company, i.e., retailers, FMCGs, independent brands, and private label producers, in order to see potential differences in their marketing strategies and the impact that certain external factors may have on their distinct activities.

The qualitative study has another limitation. Although the content of the interviews was analyzed in a very exhaustive way, some of the elements presented as main results in the discussion are based on the answers that were most frequent. Indeed, due to the very large amount of content that was processed, it proved difficult to interpret and present results that cover all of our content analysis. Future qualitative study could therefore focus on further exploring our results.

D.3.2 Selection bias

Several biases related to the selection of the persons who were interviewed have to be considered. Indeed, different criteria of selection could have led to different results than those obtained in our research. We consider that the biases can mainly be found in our panel of consumers.

Interviews with consumers.

First, the fact that the young people were selected on the basis of criteria corresponding to flexitarians leads to a bias. For instance, it could be that because of their education they are more aware of the disadvantages of eating meat, which could lead them to have a more positive opinion than the average on PBMS.

The advantage of our study is that we are now able to compare our results from the interviews with young omnivores with a group of young flexitarians, living in the city and who also received high education, and that it is possible to isolate the variable related to their choices of diet.

However, further qualitative study could explore the decision-making process of young omnivores living in the countryside or with a lower level of education. The results would probably be very different, and could this time isolate variables related to their location, or their education. This study could be interesting, given that during our interviews, some interviewees had lived in the countryside, and their

answers sometimes differed from those who had never lived there, especially concerning their attachment to meat.

Moreover, another bias exists due to the fact that the majority of our panel was composed of students, which could influence their answers, especially on their motivations regarding the price of food products.

D.3.3 An incomplete decision-making process

Exploring the values of young omnivores in relation to their food choices was complicated. Specific questions were planned (See Appendix 26) such as: 'Do you consider that your diet reflects any particular value?' or 'What do you value in your diet?'.

However, it turned out that the interviewees intellectualized their answers too much and that it was difficult for them to answer because they had never really thought about it. The analysis was therefore done by analyzing some of the verbatims where they mentioned elements that were repeated in the literature. As a consequence, the model of the decision-making process presented in the discussion is not quite complete because it lacks this part which could also have an influence on their motivations and desired benefits.

A qualitative study focusing only on the study of these values could therefore be conducted to complete our qualitative approach.

D.3.4 An incomplete strategic analysis

We have followed the strategy framework developed by Gailly (Appendix 1), in order to present some business strategies, i.e. marketing strategies. However, it appears that an important element is missing from our strategic analysis of the market, namely an analysis of the dynamic capabilities of firms.

A qualitative study of these capabilities, specific to each type of firm active in the market for PBMS, could be carried out to complete our qualitative approach.

E. General conclusion

The flexitarian trend consists in reducing meat consumption by almost half, which is based on three motivations: health, environment and animal welfare. This trend has accelerated in recent years in Europe, and 10% of the Belgian population considers itself flexitarian today (iVox, 2020). Flexitarians are also characterized by an attachment to meat as they will continue to eat it, unlike vegetarians or vegans. In addition, they are generally young, living in cities and having a high level of education.

Thus, produced from protein-rich plants, plant-based meat substitutes aim to offer an alternative to meat consumption, a product that aims to be similar to meat in terms of sensorial aspects, i.e taste, appearance, smell, and texture, and nutritional value. The value proposition of these products is to allow people still attached to meat to reduce their consumption, while not changing their eating habits and preferences. This proposition seems to be appreciated by flexitarians who consume 90% of the substitutes currently available on the market (European Commission, 2018).

In light of this growing social trend, the market for plant-based meat substitutes is a growing market in Europe, but it is still very small in terms of market share compared to conventional meat products. Over the past 5 years, more and more plant-based meat substitutes have been developed in order to offer ever more innovative products. They can now be found more and more on supermarket shelves, as the aim of the market players seems to be to make plant-based meat substitutes even more attractive and accessible than meat.

There is a growing interest in this market, and it has therefore seemed relevant to take a close look at it, especially as there is not yet so much scientific literature on the strategies adopted in this market. We therefore decided to carry out a strategic analysis of the market. Our objective was to determine what marketing strategies should be adopted in order to increase the market shares of plant-based meat substitutes.

First, a literature review has provided a context and theoretical framework for our research. Then, two separate qualitative studies have allowed us to explore different research questions.

The first qualitative study focuses on young omnivores who do not consume plant-based meat substitutes at all. It explores their values and motivations regarding their food consumption, as well as their perceptions of plant-based meat substitutes. The analysis of the results has allowed us to highlight the reasons why they did not consume these products: on the one hand, the lack of translation of their environmental and ethical motivations into desired benefits, and on the other hand, the product barriers that could be identified on the basis of their perceptions. However, some express a desire to reduce or adapt their meat consumption, which has allowed us to suggest a finer segmentation of this group of consumers. Some of them could therefore be targeted by companies in their strategy of enlarging the consumer base.

In parallel, the second qualitative study focuses on market professionals and experts. We were able to explore the impact of external factors on their activities, as well as the different marketing strategies they were implementing to increase the market shares of PBMS, with a particular focus on product development strategies. This has led to the conclusion that external factors have an increasing impact on the marketing strategies of these companies, and that it is important to consider each point of the marketing mix, i.e. to have a pricing, distribution, promotion and product strategy (Baker, 2014). Indeed, companies in this market seem to opt for two growth strategies at the same time which are on one hand the penetration of the flexitarian market with their existing products, and on the other hand an essential product development strategy through the improvement and launch of new plant-meat substitutes.

Finally, some marketing recommendations have been addressed to the companies in the sector in order to increase the market shares of plant-based meat substitutes through marketing strategies that take into account the external environment, as well as the needs of potential future customers such as young omnivores. Although further research is needed to build on and confirm our qualitative approach, this thesis has provided some progress in terms of understanding the marketing strategies to be adopted in the growing market for plant-based alternatives.

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