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Applying the Theory of Planned Behaviour to Predict the Consumption of Meat Analogues

- Master's Thesis -

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Master of Science in Marketing and Consumption

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Abstract

The increasing trend to consciously reduce meat consumption is accompanied by a strong growth in the supply and demand of meat analogue products. This study aims to predict the consumer intention to consume plant-based meat analogues based on an extension of Ajzen's (1991) theory of planned behaviour (TPB) with the four factors: perceived sensory attributes, brand trust, food curiosity, and socio-demographic characteristics and lifestyle determinants. The hypothesised model was tested based on a quantitative study (n = 348) among the German population using confirmatory factor analysis and structural equation modelling. The results indicate that perceived behavioural control (self-efficacy) (β = 0.404), attitudes (β = 0.346), subjective norms (β = 0.171), and food curiosity (β = 0.096) significantly influence the intention to consume meat analogues. While perceived sensory attributes (β = 0.756) have a strong influence on attitudes, neither perceived sensory attributes nor brand trust were found to have a significant impact on consumer intention. The behavioural intention (β = 0.851) showed a strong positive relation to the actual consumption behaviour of meat analogues. The results obtained from logistic regression indicated that there is no association between socio-demographic characteristics and the consumption of meat analogues. However, the pursuit of a flexitarian, vegetarian, or vegan diet was found to significantly influence meat analogue consumption. Thus, the promotion of meat analogue consumption in Germany and similar Western countries should particularly address consumer attitudes, perceived behavioural control, and perceived sensory attributes of meat analogues while focusing on consumers with a tendency to a flexitarian, vegetarian, or vegan diet.

Keywords

Theory of Planned Behaviour (TPB), meat analogues, perceived sensory attributes, food curiosity, brand trust, consumer intention, consumer behaviour, sustainable consumption, food consumption, confirmatory factor analysis, structural equation modelling, binary logistic regression

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1. Introduction

For many people, vegan burgers, plant-based sausages, and chicken-free nuggets are the new normal when it comes to dietary choices. Thus, the market for plant-based meat alternatives and the globally rising demand for these products (Kyriakopoulou et al., 2018) has attracted increased attention (Tso et al., 2020; Da Silva & Semprebon, 2021) from the food industry, public health policymakers, and researchers (Slade, 2018). The increase in demand is linked to a shift in consumer behaviour as a growing number of people identify themselves as flexitarian, pescetarian, vegetarian, or vegan (IfD Allensbach, 2021) on both a global and regional scale (Veganz, 2020). In a study of the European population, around 30 percent of consumers identified as flexitarian, while seven percent stated to follow a vegetarian or vegan diet (ProVeg a, 2021). About 46 percent of the sample indicated a drastic reduction in their meat consumption compared to the previous year and almost the same percentage is willing to further reduce it in the future, which points to the fact that "reducing meat consumption goes mainstream in Europe" (ProVeg b, 2021, p. 16). The boom is significantly driven by flexitarians who aim to diversify their diets by switching to plant-based options (ProVeg b, 2021). Furthermore, the transition to a more plant-based diet and reduced meat consumption is increasingly supported by the public and policymakers (Slade, 2018). Western countries in particular are faced with the need to drastically reduce the production and consumption of meat products to meet the Paris climate targets and achieve the UN Sustainable Development Goals (Fesenfeld, 2021). In addition, it is important to counteract public health issues resulting from the increasing number of cardiovascular diseases due to the high saturated fat content caused by the overconsumption of red meat (Feskens et al., 2013). According to exploratory research, the primary consumer benefits linked to plant-based dietary choices are related to personal health (Dyett et al., 2013; Janssen et al., 2016; Lea et al., 2006), environmental concerns (Janssen et al., 2016; Mullee et al., 2017), and animal welfare (Mullee et al., 2017), respectively. However, several studies have found that the most significant obstacle in switching to a plant-based diet is the satisfaction of eating meat, which is linked to the distinct texture, taste, and sentiments its intake elicits (Corrin & Papadopoulos, 2017; Lea et al., 2006; Pohjolainen et al., 2015). The result is the so-called "meat paradox", which implies that people want to consume meat, but do not want it to be associated with moral, health, or animal welfare concerns (Buttlar & Walther, 2018). This consumer dichotomy is addressed by meat analogues (also referred to as meat substitutes, mock meat, or faux meat), which are very much similar to meat in terms of appearance and smell but are made from non-animal protein (Kumar et al., 2017; Boukid, 2021; Joshi & Kumar, 2015). In 2020, the European market for these products has shown tremendous growth with a rate of 37 percent and a total of 1.4 billion euros in sales, which was strongly driven by the group of flexitarians (ProVeg b, 2021). Common meat analogues are plant-based chicken, minced meat, burger patties, sausages, and nuggets (Curtain & Grafenauer, 2019).

The aim of this study is to gain a profound understanding of consumer behaviour concerning the consumption of meat analogues by answering the research question formulated as "Which factors influence the consumption of plant-based meat analogues?". To identify relevant factors, the theory of planned behaviour (TPB) by Ajzen (1991) is used as an initial construct and is extended with additional components to strengthen its predictive and expressive power. This is in line with other exploratory studies on more complex consumption contexts such as food consumption (Dunn et al., 2011; Paul et al., 2016), especially in the field of sustainable and plant-based food (Armbrecht et al., 2020; Pandey et al., 2021). The study focuses on the market for meat analogue products in Germany, being one of the largest in Europe (Statista Consumer Market Outlook, 2022). The knowledge and insights generated contribute to the existing body of knowledge on sustainable food consumption and plant-based dietary behaviour by specifically tackling the field of meat analogues. Introducing new constructs such as food curiosity, perceived sensory attributes, and brand trust enables a profound understanding of the consumer's behaviour while further providing valuable implications for marketing practitioners in the food industry, supporting the adoption process of plant-based meat analogues in Germany and similar Western countries.

The remaining sections of this study are organised as follows: an overview of the relevant theoretical background of the theory of planned behaviour and the introduction of additional factors derived from the literature review and empirical evidence is given in section two, a description of the methodological approach in section three, followed by an analysis of the results in section four. In section five, a discussion of the derived results is provided and the resulting strengths and limitations of the study are outlined. Finally, chapter six provides concluding remarks, implications for marketing practitioners and recommendations for future research.

2. Theoretical Background

2.1 Theory of Planned Behaviour

The theory of planned behaviour (TPB) is used as a foundation for studying factors influencing consumer intention, which is further connected to the actual consumption behaviour. As one of the most influential theories, the psychological model proposes that behavioural intention is a close predictor of human social behaviour. The model comprises three fundamental components: attitudes, subjective norms, and perceived behavioural control, all of which affect an individual's behavioural intentions (Ajzen, 1991), as can be seen in *figure 1*. Multiple research has demonstrated that the three factors attitudes, subjective norms, and perceived behavioural control (self-efficacy) are relevant to predict the intention connected to the consumption of certain food products, and that intention is an important predictor for the actual consumption behaviour.

The TPB framework has been successfully applied in many studies aiming to understand and predict consumption behaviour within the food sector (Honkanen et al., 2005). The applicability of the model has been justified for dietary behaviour (McEachan et al., 2011) in general, but also for more specific domains within the sector, such as the consumption behaviour of innovative food products like functional food (Patch et al., 2005; Menozzi et al., 2017), organic food (Al-Swidi et al., 2013; Chen, 2007), and sustainable/green food (Vermeir & Verbeke, 2006; Zhu et al., 2013). More recently, the TPB model has also been used to predict the consumption of plant-based food substitutes, i.e. plant-based yoghurt alternatives, (Pandey et al., 2021; Wyker & Davison, 2010), which supports the appropriation of the model in the research context of this study. The study by Pandey et al. (2021) identified consumer attitudes and PBC as most influential factors for the consumer's intention to consume plant-based yoghurt alternatives among the Danish population. According to the authors, the relevance of PBC stems from the fact that the study is focused on consumers who already consume plant-based yoghurts (Pandey et al., 2021). Furthermore, positive attitudes towards yoghurt alternatives are linked to healthy eating, as diets consisting of plant-based foods are generally thought to be beneficial to health (Pandey et al., 2021; De Boer et al., 2013). The researchers further introduced additional constructs, in particular objective knowledge, perceived barriers, perceived sensory attributes, to the original framework and found perceived sensory attributes to have a significant impact on the intention to consume yoghurt alternatives (Pandey et al., 2021). Perceived sensory attributes are relevant since substitutes can be produced from a variety of sources (e.g., soy, coconut, almonds, etc.), each of which differs in taste, odour, or texture, which determines their sensory quality (Pandey et al., 2021).

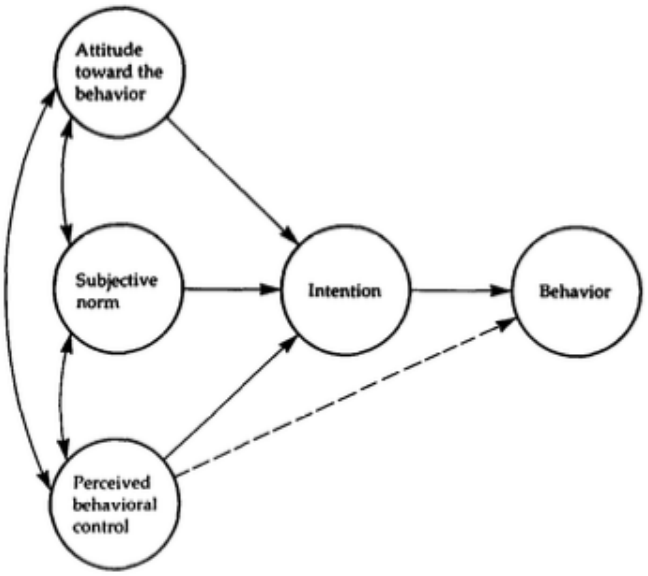

Figure 1. *The theory of planned behaviour by Ajzen (1991).*

2.1.1 Attitudes

In the TPB, attitudes serve as a proxy for an individual's overall assessment of an object, resulting in a favourable or unfavourable attitude toward it (Ajzen, 1991). In this study, consumers' attitudes towards meat analogue consumption are evaluated based on their general assessment of the consumption behaviour. Following Menozzi et al. (2017), the strength of behavioural beliefs pertaining to the primary consumption drivers identified in previous studies as environmental concerns, animal welfare, and health consciousness (forsa, 2020; Weinrich, 2018) is further used to assess the consumer attitude towards meat analogues. Thus, a favourable attitude towards the consumption of meat analogues is associated with a positive belief regarding the impact of meat analogues on the environment, the individual health, and animal welfare compared to the consumption of conventional meat (Bryant & Sanctorum, 2021; Hoeck et al., 2011).

H1: Attitudes positively affect the intention to consume meat analogues.

2.1.2 Subjective Norms

Subjective norms represent the individual's assessment of a particular behaviour, which is influenced by the opinion of significant others, such as family and friends (Ajzen, 1991). Individuals generally strive to adhere to existing social norms, which are shaped by pressure and expectations from the social environment (Ajzen, 1991). In the context of food consumption, the consumer's decision to either consume meat or refrain from the consumption of meat is commonly influenced by others (Graça et al., 2019; Povey et al., 2001), which has been proven to be similar for the consumption of meat analogues (Marcus et al., 2022). In a study by Povey et al. (2001), it was found that social norms play an important role in whether or not an individual follows a particular dietary pattern, i.e. veganism or vegetarianism, as the social context may affect dietary behaviour. Individuals may feel pressured to explain their food choices or to go along with others' opinions, especially when eating in at a restaurant or other people's homes (Povey et al., 2001). Accordingly, previous studies have led to different results regarding the influence of subjective norms on consumption intention related to food choice. While Pandey et al. (2021) have found no significant influence of subjective norms on the intention to consume plant-based yoghurt, other studies have identified subjective norms as a strong motivator for the intention to consume certain food products, i.e. organic food products, meat products, and meat alternatives (Vermeir & Verbeke, 2006; Graça et al., 2019; Marcus et al., 2022).

H2: Subjective norms positively affect the intention to consume meat analogues.

2.2.3 Perceived Behavioural Control

Perceived behavioural control (PBC) suggests that individuals do not always have the liberty to choose themselves and may be constrained by boundaries, which determine the perceived

ease or difficulty of performing certain consumption behaviours (Ajzen, 2021). In the context of food consumption, the most important control factors of PBC are self-efficacy, convenience, and availability (Conner et al., 2002; Olsen, 2004). Self-efficacy refers to both internal and external factors influencing buying behaviour (Olsen, 2004). Willpower, skills, knowledge, or lack of ability represent internal factors; whereas time, opportunity, situation, or reliance on others are external influences (Olsen, 2004). Further, convenience refers not only to a product's attributes but also to the consumer's ability to use particular resources and time as a commodity that is either spent or saved (Gofton, 1995; Furst et al. 1996). Availability refers to the general availability of products in the individuals' immediate area, i.e. in the supermarkets they visit regularly, that might be distinguished by differences in rural and urban settings (Olsen, 2004). The development of PBC before intention is essential and a positive relationship between individual control and purchase intention has been proven by previous research in the field of environmentally-friendly products (Thøgersen, 2006; Moser et al. 2011), organic foods (Taylor & Todd, 1995; Tarkiainen & Sundqvist, 2005), and plant-based food products (Pandey et al., 2021; Povey et al., 2001).

H3: Perceived behavioural control (self-efficacy, convenience, and availability) positively affects the intention to consume meat analogues.

2.2.4 Behavioural Intention & Behaviour

The individual's intention to execute a given behaviour is a central aspect in TPB. Intentions are thought to convey the motivating variables that impact a behaviour and determine their level of effort to perform the behaviour (Ajzen, 1991). The actual behaviour refers to "observable acts that are studied in their own right" (Ajzen & Fishbein, 1975; p. 335). Measuring the relationship between intention and behaviour is important in the food context because consumers often fail to act on their intention, leading to the intention-behaviour gap. (Ajzen & Fishbein, 2010). Previous studies on the consumption of plant-based dairy and meat alternatives have found a strong influence of behavioural intention on the actual consumption behaviour and have identified behavioural intention as the immediate precursor to such behaviour (Pandey et al., 2021; Tania et al., 2021).

H4: Behavioural intention positively affects the actual consumption behaviour of meat analogues.

2.2 Extension of the TPB through Literature Review

Although the TPB is one of the most influential and scientifically relevant theories to predict reasoned human behaviour, it is somewhat limited in predicting increasingly complex behaviours such as food choice (Dunn et al., 2011; Paul et al., 2016). In recent years, researchers have provided evidence that the predictive power of the model can be increased through the introduction of additional constructs or modification of the causal relationships

between the variables (Yadav & Pathak, 2016; Contini et al., 2020; Yazdanpanah & Forouzani, 2015). In the study on plant-based yoghurt alternatives, Pandey et al. (2021) have introduced the additional constructs objective knowledge, perceived barriers, perceived sensory attributes, and socio-demographic characteristics and lifestyle determinants which "increased the robustness and predictive ability of the proposed theoretical framework when predicting consumers' intention to consume plant-based yoghourt alternatives" (Pandey et al., 2021, p. 10). Given this scientific proof, this study also introduces four additional constructs to the model of TPB to predict the consumption of meat analogues. These are namely perceived sensory attributes, brand trust, food curiosity, and socio-demographic and lifestyle determinants. Hereby, perceived sensory attributes and socio-demographic and lifestyle determinants are introduced based on Pandey et al. 's (2021) findings that the sensory quality of plant-based foods and the socio-demographic characteristics play an important role in the consumption decision. The study includes brand trust and food curiosity since market research signals their impact on purchasing intention.

2.2.1 Perceived sensory attributes

Previous research indicates that perceived sensory attributes, such as taste, smell, texture, and appearance (Elzerman et al., 2013; Tuorila & Hartmann, 2020), are important factors connected to the consumption of plant-based food products. Meat consumption is generally associated with a high level of sensory satisfaction (Corrin & Papadopoulos, 2017; Lea et al., 2006; Pohjolainen et al., 2015), thus, perceived sensory attributes such as taste, smell, and texture are also highly relevant in the context of the meat analogue consumption (ProVeg b, 2021). Hoeck et al. (2011) found that product-related factors, such as perceived sensory attributes, towards meat and meat substitutes determined the consumer acceptance of meat substitutes. In particular, satisfactory perceived sensory attributes of meat analogues are associated with a higher acceptance of meat analogues (Hoeck et al., 2011; Fiorentini et al., 2020), which is associated with a more positive attitude towards such products.

H5: Perceived sensory attributes positively influence the attitudes towards meat analogues.

Furthermore, consumers' actual purchase intention is determined by the perceived sensory attributes of a food product (Hoeck et al., 2011; Fiorentini et al., 2020), which has been supported by Pandey et al. (2021) for plant-based alternative products.

H6: Perceived sensory attributes positively influence the intention to consume meat analogues.

2.2.2 Brand trust

Brand trust is found to have a significant influence on consumer's purchase intention in the food sector, especially in the sector of meat products (Ali et al., 2018; Ling et al., 2021) and

also for the consumption of plant-based foods (ProVeg b, 2020). The German market for ready-made sausage and meat products is mainly dominated by the brands Rügenwalder Mühle, Herta, Gutfried, Wiesenhof, and Meica (VuMA, 2021). In the past years, four out of these five brands have introduced vegetarian and vegan meat analogue products to their assortment to "offer [...] non-meat alternatives that also taste good to the meat lover" (Rügenwalder a, 2022). In 2021, Rügenwalder was awarded the "Most Trusted Brand" award by Reader's Digest in the vegan/vegetarian category, being one of the most prestigious German consumer awards (Rügenwalder b, 2022). In the same financial year, the brand recorded higher revenue from vegan and vegetarian meat alternatives than from conventional meat and sausage products for the first time (Mayerhofer, 2022). It is assumed that the high level of trust in these brands, particularly in Rügenwalder, influences the consumer intention to consume analogue meat products offered by these brands accordingly.

H7: Brand trust positively influences the intention to consume meat analogues.

2.2.3 Food curiosity

The initial reaction, identified as food curiosity and food neophobia (Hwang et al., 2020), towards novel foods are highly relevant (Tuorial et al., 1994) as they tend to influence the consumer's willingness to buy new food products, including meat analogues (Hwang et al., 2020). Food curiosity is defined as the consumer's "ability [...] to want to know everything that is related to food, whether at the stage of production, processing and consumption" (UEDA, 2017, p.9), while food neophobia is associated with the opposing position. Multiple studies have identified food curiosity as a driver for the consumption of novel food products in general and plant-based meat products in particular (Davitt et al., 2021), which provides further evidence for its influence on the consumption intention of meat analogues. Food neophobia is neglected in this study because it is assumed to be more of a barrier to eating meat analogues, which at the same time justifies the focus on food curiosity (Davitt et al., 2021).

H8: Food curiosity positively influences the intention to consume meat analogues.

2.2.4 Socio-demographic characteristics and lifestyle determinants

A direct link between socio-demographic characteristics such as gender (Pohjolainen et al, 2014, Lea et al., 2004), age (Pohjolainen et al, 2014; Lea et al. 2004), education (Pohjolainen et al, 2014; Hoek et al., 2003), and income (Hoek et al., 2003), and the pursuit of a plant-based diet has been validated through empirical analysis. Further, Hoeck et al. (2003) have found that area of residence and household size have an impact on the consumption of meat substitutes. Lifestyle factors such as dietary patterns also have proved to influence the consumption of meat substitutes (ProVeg b 2021; Hoeck et al., 2003). Pandey et al. (2021) have researched the impact of socio-demographic and lifestyle determinants on plant-based

yoghurts, and discovered that the typical consumer of these products is female, has a high level of education, high income and lives in urban areas, which is inline with findings on consumers following a vegetarian or vegan diet (Elzerman et al., 2013).

H9: The socio-demographic characteristics (a) gender, (b) age, (c) high level of education, (d) level of income, (e) area of residence, (f) household size and the lifestyle determinant (g) dietary pattern significantly affect the consumption behaviour of meat analogues.

2.3 The proposed research model

Based on the literature review, the proposed research model was developed, comprising nine constructs as shown in *figure 2*. The round constructs reflect components from the original TPB model, while the square constructs represent the additional constructs identified through previous research in the field. The hypothesised relationships are represented by arrows connecting the constructs.

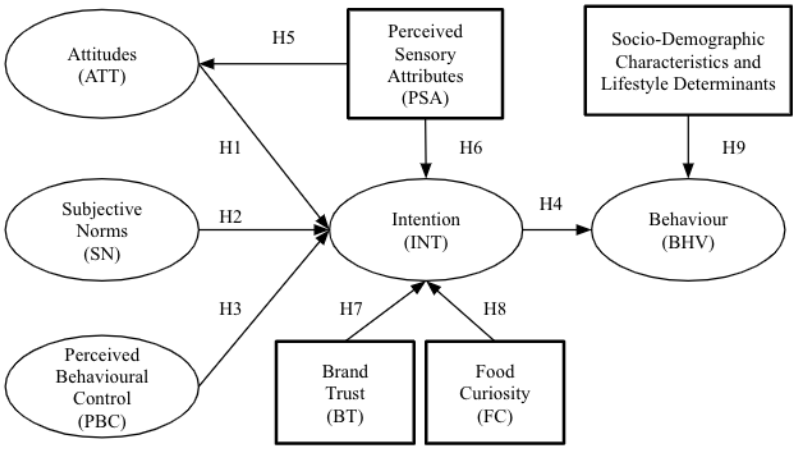

Figure 2. *The proposed research model.*

3. Method & Materials

The study was run in Germany, one of the largest markets for meat analogues in Europe (Statista Consumer Market Outlook, 2022). Its total revenue has doubled from 2019 to 2021, with a current revenue of 504 million US dollars, and is expected to reach 1 billion US dollars by 2026 (Statista Consumer Market Outlook, 2021).

3.1 Questionnaire and Measurement

An online survey was conducted to assess the factors influencing the consumption of plant-based meat analogues among the German population. The questionnaire was grouped in two major sections. The first section enquired about the proposed theoretical model constructs and items as represented in *appendix 1*. The items of the constructs were measured using a 5-point Likert scale, ranging from 1 to 5 (‘strongly disagree’ to ‘strongly agree’). The

construct attitudes was measured by four statements: “Consuming meat substitutes is favourable”, “I think consuming meat substitutes is environmentally friendly”, “I think consuming meat substitutes is beneficial for my health” and “I think consuming meat substitutes is better for animal welfare (compared to conventional meat)” (Ajzen, 1991; Bryant et al., 2019; Pandey et al., 2021; Tania & Tang, 2021). Three statements were used to assess the construct of subjective norms, which addresses the influence of significant others: “People who are important to me think I should consume meat substitutes”, “People who are important to me encourage me to consume meat substitutes” and “People who are important to me consume meat substitutes themselves” (Skallerud et al., 2021; Ajzen, 1991). Further, four statements on PBC tested self-efficacy, convenience, and availability (Conner et al., 2002; Olsen, 2004): “It’s up to me whether I eat meat substitutes or not”, “I am confident that, if I want to, I can easily consume meat substitutes”, “I think that consuming meat substitutes is a convenient option for me” and “I am confident that meat substitutes are available, if I want to consume them” (Lea & Worsley, 2003; Ajzen, 1991). Two statements were used to test the construct of food curiosity: “I am curious to try out new food products” and “I am interested in new food products and trends” (Davitt et al., 2021; Hwang et al., 2020). Next, perceived sensory attributes were measured using three statements: “I like the smell of meat substitutes”, “I like the taste of meat substitutes”, and “I like the structure of meat substitutes” (Pandey et al., 2021; Singh et al., 2016). Brand trust was measured using three statements: “I trust well-known meat product brands (e.g. Rügenwalder Mühle, Gutfried and Wiesenhof)”, “I like that well-known meat product brands produce meat substitutes” and “I prefer to buy meat substitutes from well-known meat product brands”. The construct intention was measured with the following two statements: “The likelihood that I will eat meat substitute products in the next month is high” and “I am planning to eat meat substitute products next month” (Pandey et al., 2021; Lea & Worsley, 2003). The actual consumer behaviour was measured by the statement “I consume meat substitutes regularly” (Pandey et al., 2021; Ajzen, 1991). In addition, behaviour was assessed through the second statement “How often do you consume meat substitutes?” with measures of “never”, “less than once a month”, “once a month”, “once every 2 to 3 weeks”, “once a week”, “once every 2 to 3 days”, and “every day” (Pandey et al., 2021). The second part of the survey queried socio-demographic characteristics (i.e. age, gender, education) and lifestyle determinants (i.e. dietary preferences) using multiple choice questions with predefined answer options (Pandey et al., 2021). Before starting the survey, participants were provided with a brief description about the research and made aware of the completion time (approximately 5–8 min). Further, they were incentivized by the possibility of taking part in a raffle after completing the questionnaire. The purpose of the incentive is to achieve a higher response rate by arousing participants' intrinsic motivation to complete the questionnaire (Wolff-Eisenberg, 2016). A person's higher intrinsic motivation can lead to more thoughtful responses and further interest from other individuals (Deci et al., 1999).

3.2 Data Collection and Sample

The data was collected between March 12th and March 26th, 2022 using convenience (snowball) sampling. The use of a non-probability sampling method allowed for low-cost data collection and did not require a strict predefined sampling frame. However, the method is more vulnerable to biassed and inaccurate results with a lower degree of representativeness compared to a probability sampling method (Kalton, 1983). The study was set up in both English and German using the end-to-end platform Quantilope and the invitation link was distributed to personal contacts on social media platforms (in particular WhatsApp, Instagram, Facebook, and LinkedIn), who further shared the participation link with their own network. Only participants who currently live in Germany and have tried plant-based meat analogues at least once were able to complete the survey, all others received a screen-out after the control questions 'Do you currently live in Germany?' and 'Have you ever tried a plant-based meat substitute?'. In total, 472 respondents started the survey of which 15 % (n = 71) received a screen-out and 11% (n = 51) cancelled the survey, rendering a response rate of 73 % (n = 348). This sample size meets the required size of 200 and above to achieve adequate statistical power for exploratory research (Singh et al., 2018) and the required sample-to-items ratio of 10 per construct item for model precision ensuring true population values are represented by the constructs in the study (Kline, 2016). The study was conducted in compliance with the requirements of research ethics. These include, in particular, information, consent, trust and confidence of the study participants (Eriksson & Kovalainen, 2008).

3.3 Analytical Procedure

Jamovi 2.3.0.0 and STATA SE 17 Graphics were used to test the study model in a two-step approach as proposed by Anderson and Ginberg (1988). In the first step, the measurement model was validated using confirmatory factor analysis, and the items' and constructs' reliability and validity were investigated. Structural equation modelling was then utilised to assess the model's fit and to test the hypothesis. Furthermore, a binary logistic regression analysis was conducted in IBM SPSS Statistics 28 to analyse the relationship between plant-based meat analogue consumption and socio-demographic and lifestyle factors (Pandey et al., 2021).

4. Results

4.1 Socio-Demographic Characteristics and Lifestyle Determinants

The online survey was completed by a total sample of 348 participants who have tried meat analogues at least once and are permanent residents in Germany. The results in *table 1* indicate that the overall sample is heterogeneous. Nevertheless, the data shows some bias as the majority of participants is in their twenties (62 % of the participants), predominantly female (65 % of the participants), living in an urban area (63 % of the participants), having a high level of education (79 % of the participants), and living in a small household (69 % of

the participants). However, the level of monthly household net income is relatively equally distributed. Half of the participants identified as flexitarians (51 % of participants), while a significant share followed a vegetarian or vegan diet (22 % of participants).

Table 1. Socio-Demographic characteristics.

Variable	Categories	%	n
Age	< 20	3 %	9
	20 <= 30	62 %	217
	30 <= 40	22 %	77
	40 <= 50	4 %	15
	50 <= 60	6 %	21
	60 <= 70	1 %	5
	70 <= 80	1 %	2
Gender	Male	35 %	120
	Female	65 %	225
	Non-binary	0 %	1
Area of residence	Urban	63 %	218
	Suburban	15 %	53
	Rural	22 %	75
Level of education	High school degree or equivalent (GED)	9 %	30
	Vocational qualification/apprenticeship	10 %	34
	Bachelor's degree (BA, BS)	38 %	132
	Master's degree (MA, MS, MED)	39 %	135
	Doctorate (PhD, EdD)	2 %	7
	Prefer not to answer	3 %	9
Household size	1 person (I live alone)	26 %	90
	2 people	43 %	148
	3 people	14 %	50
	4 people	15 %	53
	5 or more people	2 %	7
Monthly household net income	below 900 EUR	12 %	42
	900 - 1.299 EUR	8 %	29
	1.300 - 1.499 EUR	6 %	20
	1.500 - 1.999 EUR	11 %	37
	2.000 - 2.599 EUR	12 %	42
	2.600 - 3.199 EUR	13 %	45
	3.200 - 4.499 EUR	14 %	47
	4.500 - 5.999 EUR	9 %	32
	above 6.000 EUR	6%	20
	Prefer not to answer	10 %	34
Dietary preferences*	Omnivore	20 %	60
	Flexitarian	51 %	179
	Pescetarian	6 %	20
	Vegetarian	12 %	43
	Vegan	10 %	36

Note: *Dietary preferences: Omnivore (I frequently eat meat, such as beef, pork, chicken, turkey, fish and/or shellfish); Flexitarian (I sometimes eat meat, but I am trying to reduce my meat consumption and often choose plant-based foods instead); Pescetarian (I eat fish and/or shellfish, but no other types of meat); Vegetarian (I don't eat meat and fish of any kind, but I do eat eggs and/or dairy products); Vegan (I don't eat meat, fish, eggs, dairy products, or any other animal-based ingredients)

4.2 Confirmatory Factor Analysis and Reliability and Validity Tests

In the proposed theoretical model attitudes, social norms, PBC, food curiosity, perceived sensory attributes, and brand trust predict the intention to consume meat analogues. Intention is further used to predict the actual behaviour of consuming meat analogues. The overall measurement model is tested in terms of validity and reliability as shown in *table 2*. On the basis of 23 variables, a confirmatory factor analysis (CFA) is performed. As per Jöreskog and Sörbom (1982), all items are found to be significant ($p < 0.001$) with the exception of non-significant variable PBC 1 ($p = 0.082$), which is removed accordingly. Most items show satisfactory factor loadings above 0.50, however PBC 4 (0.30) is removed from the model due to a low standardised factor loading while PBC 2 (0.47) and BT 3 (0.46) remain in the measurement model to support the underlying theory. Further, the item FC 3 is removed from the model to increase the internal reliability of the construct with a Cronbach's alpha result of 0.764. The model fit the data well ($\chi 2 = 290$; $df = 143$; $p < 0.001$; CFI = 0.956; TLI = 0.942; RMSEA = 0.0545) (Hair et al., 2014) and one-dimensionality of the constructs is supported by the statistical results (CFI $\geq$ 0.90) (Kline, 2005). Internal consistency and reliability are measured based on two different indicators. The measurements of AVE are above the suggested level of 0.50 for most constructs. Only the two constructs attitudes (0.39) and brand trust (0.40) score below the target level. The scores for composite reliability are at 0.65 or higher for all constructs, which indicates a degree of internal consistency among the measures that are above the recommended level of 0.60 (Bagozzi, 1991). Overall, the suggested theoretical model's convergent and discriminant validity and reliability scores are acceptable.

Table 2. Standardised factor loadings and reliability of constructs.

Constructs	Items	Factor loading	Cronbach's alpha	AVE	CR
1 Attitudes	AT 1	0.752	0.711	0.389	0.714
	AT 2	0.625			
	AT 3	0.568			
	AT 4	0.527			
2 Social Norms	SN 1	0.856	0.813	0.617	0.825
	SN 2	0.863			
	SN 3	0.610			
3 PBC	PBC 1		0.611	0.591	0.720
	PBC 2	0.471			
	PBC 3	0.978			
4 Food Curiosity	FC 1	0.750	0.764	0.628	0.771
	FC 2	0.833			

Constructs	Items	Factor loading	Cronbach's alpha	AVE	CR
5 Sensory Attributes	PSA 1	0.548	0.770	0.556	0.784
	PSA 2	0.886			
	PSA 3	0.762			
6 Brand Trust	BT 1	0.623	0.678	0.397	0.654
	BT 2	0.768			
	BT 3	0.460			
7 Intention	INT 1	0.960	0.959	0.922	0.959
	INT 2	0.960			
8 Behaviour	BVR 1	1.000	-	-	-

Table 3 shows that all intercorrelations between constructs are significant and score between 0.12 and 0.84. The constructs' discriminant validity is assessed using the method proposed by Fornell and Larcker (1981). The square root of the average variance extracted (AVE) is in all cases higher than the squared inter-construct correlation. Accordingly, there are no problems with discriminant validity for the tested model (Hair et al., 2014).

Table 3. Means, standard deviations, and correlations among the constructs.

			Correlations							
Constructs	***Mean***	***SD***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1 Attitudes	3.99	0.67	**0.62**							
2 Social Norms	3.10	0.95	0.43	**0.79**						
3 PBC	4.11	0.85	0.62	0.29	**0.77**					
4 Food Curiosity	4.04	0.83	0.32	0.12*	0.29	**0.79**				
5 Sensory Attributes	3.21	0.76	0.68	0.44	0.67	0.27	**0.75**			
6 Brand Trust	3.47	0.80	0.55	0.18*	0.33	0.14*	0.44	**0.63**		
7 Intention	3.88	1.29	0.72	0.44	0.70	0.31	0.66	0.39	**1.00**	
8 Behaviour	3.41	1.40	0.65	0.49	0.66	0.31	0.66	0.28	0.84	**1**

Note: All correlations are significant at $p < 0.001$ or $*p < 0.050$; Bold values in the diagonal line represent the square root of AVE; Correlation was estimated through Pearson's Correlation test; ns = non-significant

4.3 The Goodness of Fit Result

Structural equation testing is performed to evaluate the model fit of the proposed theoretical framework (*figure 2*). The obtained goodness of fit indices indicate a good fit of the proposed theoretical framework ($\chi2 = 363.286$, $\chi2/df = 2.374$, $p < 0.000$, GFI = 0.90, TLI = 0.923, CFI = 0.938, and RMSEA = 0.063), thus all values are above the recommended threshold and yielded satisfactory results (Hair et al., 2014).

4.4 Hypothesis Testing Result

The results from structural analysis testing (*figure 3*) show that attitudes (β = 0.346, p < 0.000), social norms (β = 0.171, p < 0.000), PBC (self-efficacy) (β = 0.404, p < 0.000) and food curiosity (β = 0.096, p < 0.05) are significantly related to the consumption intention of plant-based meat analogues. Hence, hypotheses H1, H2, H3, and H8 are supported, respectively. On the other hand, perceived sensory attributes (β = 0.040, p = 0.729) and brand trust (β = 0.009, p = 0.078) are not significant predictors of intention to consume plant-based meat analogues, rejecting hypothesis H6 and H7, respectively. However, perceived sensory attributes (β = 0.756, p < 0.000) are a significant predictor of attitudes towards meat analogues, accepting hypotheses H5. Intention (β = 0.851, p < 0.000) is a positive and significant predictor of behaviour to consume meat analogues, thus H4 is supported. Detailed information on the hypothesis testing results and their status are shown in *table 4*.

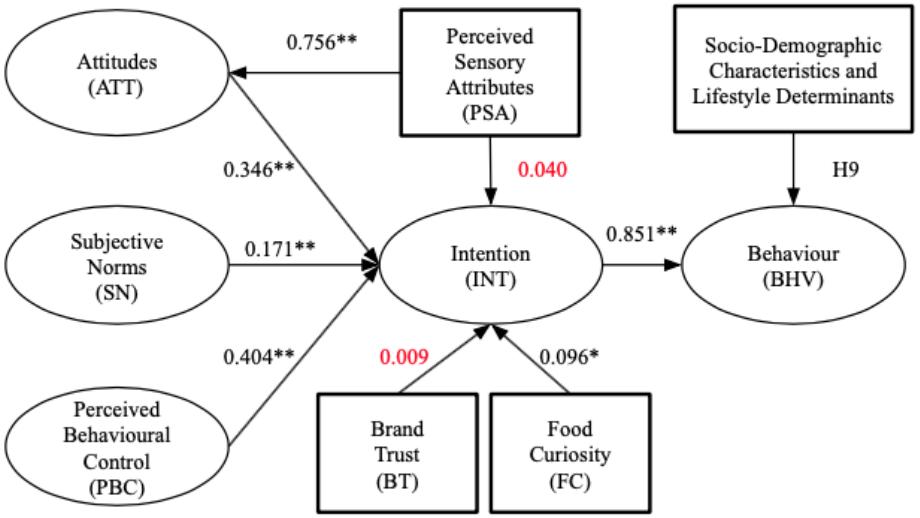

Figure 3. Structural relation between constructs (N = 348).

Note: *significant effect at p < 0.05, **significant effect at p < 0.01, ***significant effect at p < 0.001

Table 4. Hypothesis testing results and their status.

Path	Hypothesis	Standardised Estimate (β)	Standard error	t-value	p-value
ATT → INT	H1	0.346	0.139	4.22	0.000**
SN → INT	H2	0.171	0.061	3.70	0.000**
PBC → INT	H3	0.404	0.263	4.76	0.000**
INT → BHV	H4	0.851	0.037	26.35	0.000**
PSA → ATT	H5	0.756	0.148	8.34	0.000**
PSA → INT	H6	0.040	0.318	0.35	0.729
BT → INT	H7	0.009	0.078	0.18	0.467
FC → INT	H8	0.096	0.086	2.08	0.037*

Note: *significant effect at p < 0.05, **significant effect at p < 0.001; ATT = attitudes, SN = subjective norms, PBC = perceived behavioural control (self-efficacy), INT = intention, FC = food curiosity, PSA = perceived sensory attributes, BT = brand trust.

The association between plant-based meat analogue consumption behaviour and socio-demographic and lifestyle determinants is assessed through logistic regression analysis. The binomial logistic regression model is statistically significant, $\chi^2(8) = 18.760$, $p < .050$, indicating a very low level of variance explained (Backhaus et al., 2003), as shown by Nagelkerke's $R^2 = 0.120$. Overall percentage of accuracy in classification is 62.9 %, with a sensitivity of 66.0 % and a specificity of 60.3 %. The results (*table 5*) indicate that only dietary preferences have a significant association with behaviour towards plant-based meat analogues supporting hypothesis H9g. Participants who consider themselves as flexitarian, pescetarian, vegetarian, or vegan are more likely to frequently consume plant-based meat analogues than people who identify themselves as omnivore (odds ratio 3.796). However, age, gender, urban area of residence, a high-level education, a small household size, and a high-level net income do not have a significant association with behaviour towards plant-based meat analogues. Accordingly, hypotheses H9a through H9f are rejected.

Table 5. Association between plant-based meat analogue behaviour and socio-demographic characteristics and lifestyle determinants (N = 348).

Variables	Hypothesis	Odds Ratio (OR)	95% Confidence Interval	p-value
Age (years)	H9a	1.129	0.693 - 1.841	0.626
Gender (female = 1)	H9b	0.715	0.440 - 1.161	0.175
Region (urban = 1)	H9c	1.500	0.893 - 2.519	0.126
High-level education (1)	H9d	1.388	0.744 - 2.592	0.303
Small household size (1)	H9e	0.842	0.500 - 1.421	0.520
High-level net income (1)	H9f	1.389	0.809 - 2.386	0.233
Dietary Preferences (1)	H9g	3.796	2.151 - 6.699	<0.001
Constant		0.216		<0.001

Note: Logistic regression with the dependent variable as behaviour towards plant-based meat analogue with consumption frequency 'Once a week', 'Once every 2 to 3 days' and 'Everyday' coded as 1 and consumption frequency 'Never', 'Less than once a month', 'Once a month' and 'Once every 2 to 3 weeks' coded as 0. High-level education = Bachelor and above. High-level net income = 3.200 € and above. Dietary preferences 'Flexetarian', 'Pescetarian', 'Vegetarian', and 'Vegan' coded as 1 and 'Omnivore' coded as 0.

5. Discussion and Limitations

The study is driven by the underlying purpose to contribute to recent research by identifying drivers for consumer behaviour regarding the consumption of plant-based meat analogues in Germany by using the TPB as a conceptual framework. In general, the application of TPB to explain the consumption of plant-based meat analogues among German consumers is supported by the results. The relationship between attitudes ($\beta = 0.346$) and intention is significant and thus supports the proposed hypothesis H1. This result is similar to previous studies in the field of sustainable food consumption, including alternative dairy and meat products (Pandey et al., 2021; Marcus et al., 2022). The integration of the top motives for the consumption of meat analogues, namely environmental concerns, animal welfare, and health

consciousness (Hoeck et al., 2011), in the construct of attitudes is further supported, indicating that the general attitude towards meat analogues is dependent on the three motivators. Next, the results show that subjective norms (β = 0.171) significantly influence the intention to consume plant-based meat analogues, confirming the predicted relationship by Ajzen (1991) and accepting the proposed hypothesis H2. The results are in line with previous research on the consumption of meat and meat alternatives (Marcus et al., 2022; Povey et al., 2001) supporting the assumption that the intention to consume meat analogues can be influenced by the social environment and specifically people who are important to the consumer. Comparing the result with previous studies on the consumption of plant-based yoghurt alternatives (Pandey et al., 2021) or sustainable fish (Skullerud et al., 2021), in which no significant influence of subjective norms on consumption intention has been found, it is assumed that the social environment plays a major role in the consumption context of plant-based meat analogues. This might be influenced by the ongoing socio-cultural debate on the reduction of meat consumption in Germany and the high level of awareness among the population. Furthermore, the study participants' proximity to the researchers, who themselves patronise meat substitutes, could have affected the results. However, the positive effect is also supported by studies on the influence of social norms on the pursuit of a vegetarian lifestyle (Fox & Ward, 2008) and the choice for or against the consumption of meat (Graça et al. 2015; Povey et al., 2001). Perceived behavioural control (self-efficacy) turns out to be the most significant predictor (β = 0.421) of intention, which is similar to prior studies on the consumption of plant-based food products (Pandey et al., 2021; Povey et al., 2001) and research on dietary behaviour in general (McEachan et al., 2011). Thus, the third hypothesis H3 is accepted accordingly. The high level of perceived behavioural control towards the intention to consume plant-based meat analogues, could potentially be explained by the limitation of the study to consumers who have already eaten plant-based meat alternatives. Moreover, the results indicate that it is critical to provide knowledge and tools to enhance people's level of self-efficacy with regard to consuming meat analogue products. The products must also be convenient to use and easy to obtain. Allowing people to make their choice regarding meat analogue products at home and in social contexts, according to Corrin and Papadopoulos (2019), will greatly improve their conviction in their capacity to control their food choices. Next, the results of the study show a very strong relationship between behavioural intention and actual behaviour (β = 0.851), outweighing the risk of an intention-behaviour gap (Ajzen & Fishbein, 2010). Accepting hypothesis H4 indicates that the consumer intention to consume meat analogues serves as a proxy for their actual consumption behaviour. This finding is consistent with previous research in the field (Tania et al., 2016; Pandey et al., 2021). Yet, the fact that all participants had previously consumed meat analogues may have skewed the results, showing a stronger association between past and future consumption behaviour.

The expansion of the TPB framework includes the introduction of the additional constructs of perceived sensory attributes, food curiosity, and brand trust. Perceived sensory attributes are assumed to have a direct relationship with attitudes and behavioural intention. The results of the study indicate that perceived sensory attributes ($\beta = 0.756$) have a strong influence on the consumer attitude towards meat analogues, leading to the acceptance of hypothesis H5 respectively. Thus, consumers who are satisfied by the perceived sensory attributes of meat analogues potentially have a more favourable attitude towards the products, which influences their consumption intention positively. This finding further supports previous studies on the importance of sensory satisfaction in meat analogue consumption (Hoeck et al., 2011; Fiorentini et al., 2020). In contrast to previous studies (Pandey et al., 2021), the hypothesised direct relationship between perceived sensory attributes and behavioural intentions is not found to be significant, so hypothesis H6 is rejected. Accordingly, there is no direct effect of perceived sensory attributes on consumption intention. However, the acceptance of the previous hypothesis H5 suggests that attitudes mediate the influence of perceived sensory attributes, suggesting an indirect effect on consumption intention. The results reveal no significant relationship between brand trust and behavioural intention, rejecting hypothesis H7 respectively. Although consumers perceive the offer of meat analogues by well-known meat product brands (i.e. Rügenwalder Mühle, Gutfried and Wiesenhof) as positive, there is no direct correlation between the level of brand trust and consumption intention of meat analogues. Again, the fact that all participants had previously tried meat analogues may have influenced this outcome, as there is already some familiarity with the product category and products from other brands might have been tried. The study's significant percentage of vegetarian and vegan consumers might also have had an impact, as this group is customarily quite familiar with other brands in the plant-based sector (ProVeg b, 2021), including brands that exclusively offer vegan or vegetarian products. Finally, the relationship between food curiosity ($\beta = 0.096$) and behavioural intention is found to be significant, but just below the acceptable threshold. Still, hypothesis H8 is accepted respectively. As indicated by previous research, food curiosity can function as a driver for the consumption of novel food products including plant-based meat products (Davitt et al., 2021). The fact that all participants had tried meat analogues at least once might have influenced their perception of meat analogues as novel food products. Further, the high percentage of vegetarians and vegans in the sample could bias the results, as this group is prone to try out alternative products due to the exclusion of certain food products from their diet (ProVeg b, 2021).

Furthermore, the study assesses the impact of socio-demographic characteristics and lifestyle determinants on consumption behaviour. Existing research suggests that plant-based meat analogue consumption is linked to gender (Pohjolainen et al., 2014, Lea et al., 2004), age (Pohjolainen et al., 2014; Lea et al. 2004), education (Pohjolainen et al., 2014; Hoek et al., 2003), income (Hoek et al., 2003), area of residence (Hoek et al., 2003) and household size (Hoek et al., 2003). These characteristics, tested with H9a through H9f, are not shown to be a

significant predictor for meat analogue consumption among Germans. The divergence from previous research might indicate that plant-based meat analogues are becoming more commonplace and that consumers are increasingly incorporating them into their diets, regardless of age, gender, education, income, household size or area of residence. While Pandey et al. (2021) have discovered that the typical consumer of plant-based yoghurts is female, has high education, high income and resides in urban areas (Elzerman et al., 2013), the current findings contradict this assertion in the context of meat analogues. It can be argued that meat analogues are more than simply a craze among wealthy city dwellers and have become a popular alternative to meat products among different demographics. This reflects the broader trend toward more sustainable and conscious food consumerism, as well as a willingness to reduce meat consumption and the increasing tendency of people following a flexitarian diet (IfD Allensbach, 2021; ProVeg a, 2021). Unlike the aforementioned socio-demographic characteristics, dietary patterns (Hoek et al., 2003), which are evaluated with hypothesis H9g, are found to have a beneficial impact on meat analogue consumption. People who follow a flexitarian, pescetarian, vegetarian, or vegan diet are more likely than those with an omnivore diet to consume plant-based meat substitutes. This finding confirms that plant-based meat analogues are consumed by not just vegans and vegetarians, but also flexitarians and pescetarians. This is also reflected in a recent study, which found that flexitarians who want to vary their diets by transitioning to plant-based food choices are significantly driving the growth of the meat substitute market (ProVeg b, 2021).

The study used an expansion of the TPB model to analyse consumer intention and behaviour in the context of meat analogues by combining previous findings in the field with the well-established TPB framework. The factors influencing plant-based meat analogue consumption, as well as the relationship between meat analogue consumption and socio-demographic factors and lifestyle variables, are investigated in the study. On the other hand, the study has a number of drawbacks, which are addressed to guide future research. First, the sample does not allow for causal inference, as the representativeness of the sample was not maintained. The sample is biassed towards female respondents in their twenties with a high-level of education and residence in an urban area, which are generally identified as a group of consumers more open to the consumption of meat analogues (Elzerman et al., 2013). Further, the proportion of respondents who describe themselves as flexitarians, vegetarians or vegans is higher than the population average (forsa, 2021), which might further bias the general validity of the responses. Accordingly, the results cannot be generalised for the German population. Second, the scope of the study is limited to plant-based meat analogues, which are “food product[s] that approximate [...] the aesthetic qualities and/or chemical characteristics of certain types of meat” (Kumar et al., 2017, p. 924). Hereby, the area of interest is narrowed down by eliminating plant-based meat alternatives that are used to substitute meat but do not have the same characteristics as analogue products, i.e. vegetable balls. Third, the two constructs attitudes (0.39) and brand trust (0.40) have revealed

unsatisfactory values for the AVE measures, while both of them have yielded the required CR score and met the Fornell and Larcker (1981) criterion. Yet, convergent validity has been assumed and the constructs have been used for further analysis. However, future research on the consumption should pay close attention to how these constructs are measured.

6. Conclusions, Implications and Future Research

The present study contributes to the academic research on sustainable consumer behaviour by empirically testing the TPB framework including four newly added constructs, in particular perceived sensory attributes, brand trust, food curiosity and socio-demographic characteristics and lifestyle determinants, in the context of meat analogues. The introduction of the additional constructs have resulted in an expanded model, allowing for the assessment of factors impacting the consumer's intention to consume meat analogues. The study finds that perceived behavioural control, attitudes, subjective norms and food curiosity influence the consumption of plant-based meat analogues among consumers in Germany. However, perceived sensory attributes and brand trust are found not to show a significant influence on the intention to consume meat analogues. Further, attitudes towards meat analogues are shown to be strongly influenced by perceived sensory attributes, such as the product's smell, taste and structure. Moreover, the results confirm that people following a vegan, vegetarian, flexitarian or pescetarian diet are more likely to purchase meat substitutes than omnivores. Socio-demographic characteristics, such as gender, age, education, income, area of residence and household size have no significant impact on the consumption of plant-based meat analogues.

From a marketing perspective, the results of this study reveal a number of implications for practitioners in the field. To increase the consumption of meat analogues among the German population, marketers can specifically address the outlined factors influencing consumption intention. Consumers relate benefits to plant-based meat analogues to personal health (Dyett et al., 2013; Janssen et al., 2016; Lea et al., 2006), environmental concerns (Janssen et al., 2016; Mullee et al., 2017), and animal welfare (Mullee et al., 2017). According to the findings of this study, the three factors also have a positive impact on consumer attitudes about meat analogues, which can be further increased and stressed by educating consumers about the benefits. Possible communication messages include the CO_2 emission savings compared to conventional meat, or the health benefits of meat analogues and a plant-based diet in general, i.e. reducing the risk of cardiovascular diseases. In addition, ethical and emotional aspects of the consumption of meat analogues could be communicated, i.e. how many animal lives can be saved by choosing a plant-based product. Ensuring desirable sensory attributes of meat analogues, including taste, smell and texture, and communicating them effectively can further strengthen consumers' positive attitudes towards these products. In addition, encouraging consumers to spread awareness of meat analogues in their social environment could increase the willingness to consume meat analogues in the general

population. The impact of PBC on consumption intention highlights the importance of ensuring a high level of product availability while highlighting the convenience aspects of consumption in the communication. Despite the low effect of food curiosity, promotion and advertising of meat analogues could still be useful to increase product trials. The results on socio-demographic and lifestyle determinants suggest that targeting consumer segments in relation to meat analogue products is not necessary. Instead, products should be made available to the general public by maximising visibility and exposure at the point of sale.

For future studies, it is recommended to use a larger and statistically representative consumer sample and to conduct a longitudinal study in a cross-national context. Furthermore, the TPB model could be combined with a segmentation approach to better understand the complexity of food choices in the context of meat analogue consumption. In addition, future research should focus on how communication campaigns could deliver effective messages about the benefits of meat analogues to strengthen consumers' positive attitudes towards the product. In particular, the environmental, health and animal welfare benefits should be considered, and perceived sensory attributes of meat analogues should be addressed. From a theoretical point of view, for future research in the field of sustainable consumer behaviour, it is recommended to also extend the TPB model with appropriate constructs to increase the validity of the model and to explain consumer behaviour more precisely.

7. Literature

Ajzen, I. (1991). *The theory of planned behavior.* Organizational Behavior and Human Decision Processes, 50(2), 179-211.

Ajzen, I. (2002). *Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior.* Journal of Applied Social Psychology, 32(4), 665-683.

Ajzen, I., & Fishbein, M. (2010). *Predicting and changing behavior: The reasoned action approach.* Psychology Press.

Anderson, J., & Gerbing, D. (1988). *Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach.* Psychological Bulletin, 103, 411-423.

Bielinska, K., Rehder, L., & Trautmann, W. (2020). *Germany: Germany is Leading a Vegalution - Vegan Revolution - in Europe.* USDA Foreign Agricultural Service. Retrieved December 11th, 2021, from https://www.fas.usda.gov/data/germany-germany-leading-vegalution-vegan-revolution-europe

Bundesministerium für Ernährung und Landwirtschaft (2008). *Nationale Verzehrsstudie II: Wie sich Verbraucher in Deutschland ernähren.* Retrieved February 3rd, 2022, from https://www.bmel.de/DE/themen/ernaehrung/gesunde-ernaehrung/nationale-verzehrsstudie-zusammenfassung.html

Buttlar, B. & Walther, E., (2018). *Measuring the meat paradox: How ambivalence towards meat influences moral disengagement.* Appetite, 128, 152–158.

Bryant, C., Szejda, K., Parekh, N., Deshpande, V., & Tse, B. (2019). *A Survey of Consumer Perceptions of Plant-Based and Clean Meat in the USA, India, and China.* Front. Sustain. Food Syst. 3, 11.

Chen, M.F. (2007). *Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: moderating effects of food-related personality traits.* Food Quality and Preference. Vol. 18 No. 7. 1008-1021.

Conner, M., Norman, P., & Bell, R. (2002). *The theory of planned behaviour and healthy eating.* Health Psychology, 21(2), 194–201.

Contini, C., Boncinelli, F., Marone, E., Scozzafava, G., & Casini, L. (2020). *Drivers of plant-based convenience foods consumption: Results of a multicomponent extension of the theory of planned behaviour.* Food Quality and Preference, 84, 103931.

Corrin, T., & Papadopoulos, A. (2017). *Understanding the attitudes and perceptions of vegetarian and plant-based diets to shape future health promotion programs.* Appetite, 109, 40–47.

Curtain, F., & Grafenauer, S. (2019). *Plant-based meat substitutes in the flexitarian age: An audit of products on supermarket shelves.* Nutrients, 11(11), 2603.

Silva, C., & Semprebon, E. (2021). *How about Cultivated Meat? the Effect of Sustainability Appeal, Environmental Awareness and Consumption Context on Consumers' Intention to Purchase.* Journal of Food Products Marketing, 27(3), 142-156.

Davitt, E., Winham, D., Heer, M., Shelley, M., & Knoblauch, S. (2021). *Predictors of Plant-Based Alternatives to Meat Consumption in Midwest University Students.* Journal of Nutrition Education and Behavior, 53(7), 564-572.

De Boer, J., Schösler, H., & Boersema, J. (2013). *Climate change and meat eating: An inconvenient couple?* Journal of Environmental Psychology, 33(1), 1-8.

Deci, E., Koestner, R., & Ryan, R. (1999). *A Meta-Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation.* Psychological Bulletin, 125(6), 627-668.

Dunn, K., Mohr, P., Wilson, C., & Wittert, G. (2011). *Determinants of fast-food consumption. An application of the Theory of Planned Behaviour.* Appetite, 57(2), 349-357.

Dyett, P., Sabaté, J., Haddad, E., Rajaram, S., & Shavlik, D. (2013). *Vegan lifestyle behaviors. An exploration of congruence with health-related beliefs and assessed health indices.* Appetite, 67, 119-124.

Elzerman, J., Van Boekel, M., & Luning, P. (2013). *Exploring meat substitutes: Consumer experiences and contextual factors.* British Food Journal (1966), 115(5), 700-710.

Eriksson, P., & Kovalainen, A. (2008). *Qualitative methods in business research.*

Fesenfeld Dr., L. (2021). *Active state: the political economy of transforming the meat system.* Heinrich Böll Stiftung Brussels. Retrieved March 9th, 2022, from https://eu.boell.org/en/2021/09/07/active-state-political-economy-transforming-meat-system

Fiorentini, M., Kinchla, A., & Nolden, A. (2020). *Role of sensory evaluation in consumer acceptance of plant-based meat analogs and meat extenders: A scoping review.* Foods, 9(9), 1.

Fornell, C., & Larcker, D. (1981). *Evaluating Structural Equation Models with Unobservable Variables and Measurement Error.* Journal of Marketing Research, 18(1), 39.

Fox, N., & Ward, K. (2008). *Health, ethics and environment: A qualitative study of vegetarian motivations.* Appetite, 50, 422–429.

Fuentes, M., & Fuentes, C. (2021). *Reconfiguring food materialities: Plant-based food consumption practices in antagonistic landscapes.* Food, Culture, & Society, 1.

Furst, T., Connors, M., Bisogni, C., Sobal, J., & Falk, L. (1996). *Food Choice: A Conceptual Model of the Process.* Appetite, 26(3), 247-266.

Graça, J., Godinho, C. A., & Truninger, M. (2019). *Reducing meat consumption and following plant-based diets: Current evidence and future directions to inform integrated transitions.* Trends in Food Science & Technology, 91, 380–390.

Gofton, L. (1995). *Convenience and the moral status of consumer practices.* Food choice and the consumer, 152-181.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis: Pearson new international edition*.

Hetzner, C. (2021). *Bratwurst-loving Germans are embracing a trend for healthier, ethical veggie 'meats'.* Fortune. Retrieved December 11, 2021, from https://fortune.com/2021/05/18/germany-veggie-meats-bratwurst/

Hoek, A., Luning, P., Weijzen, P., Engels, W., Kok, F., & De Graaf, C. (2011). *Replacement of meat by meat substitutes. A survey on person- and product-related factors in consumer acceptance.* Appetite, 56(3), 662-673.

Honkanen, P., Olsen, S., & Verplanken, B. (2005). *Intention to consume seafood—the importance of habit.* Appetite, 45(2), 161-168.

Hwang, J., You, J., Moon, J., & Jeong, J. (2020). *Factors Affecting Consumers' Alternative Meats Buying Intentions: Plant-Based Meat Alternative and Cultured Meat.* Sustainability (Basel, Switzerland), 12(14), 5662.

IfD Allensbach (2021). *Personen in Deutschland, die sich selbst als Veganer einordnen oder als Leute, die weitgehend auf tierische Produkte verzichten, in den Jahren 2015 bis 2021.* Allensbacher Markt- und Werbeträger-Analyse - AWA 2021. Retrieved February 3rd, 2022, from https://www.ifd-allensbach.de/awa/startseite.html and https://de-statista-com.ezproxy.hwr-berlin.de/statistik/daten/studie/445155/umfrage/umfrage-in-deutschland-zur-anzahl-der-veganer/

Janssen, M., Busch, C., Rödiger, M., & Hamm, U. (2016). *Motives of consumers following a vegan diet and their attitudes towards animal agriculture.* Appetite, 105, 643-651.

Joreskog, K., & Sorbom, D. (1982). *Recent Developments in Structural Equation Modeling.* Journal of Marketing Research, 19(4), 404.

Kalton, G. (1983). *Introduction to survey sampling* (Quantitative applications in the social sciences ; no. 07-035). Newbury Park, [Calif.] ; London: SAGE.

Kyriakopoulou, K.; Dekkers, B.; & van der Goot, A.J. (2018). *Plant-Based Meat Analogues.* Sustainable Meat Production and Processing, 103-126.

Kline, R. (2016). *Principles and practice of structural equation modeling* (Fourth ed., Methodology in the social sciences).

Kopplin, C., & Rausch, T. (2021). *Above and beyond meat: The role of consumers' dietary behavior for the purchase of plant-based food substitutes*. Review of Managerial Science.

Kalton, G. (1983). *Introduction to survey sampling* (Quantitative applications in the social sciences ; no. 07-035). Newbury Park, [Calif.] ; London: SAGE.

Lea, E., & Worsley, A. (2003). *Benefits and barriers to the consumption of a vegetarian diet in Australia.* Public Health Nutrition, 6(5), 505-511.

Lea, E., & Worsley, A. (2004). *What proportion of South Australian adult non-vegetarians hold similar beliefs to vegetarians?* Nutrition & Dietetics, 61(1), 11-21.

Lea, E., Crawford, D. & Worsley, A., (2006). *Public views of the benefits and barriers to the consumption of a plant-based diet.* European journal of clinical nutrition, 60(7), 828–837.

Marcus, N., Klink-Lehmann, J., & Hartmann, M. (2022). *Exploring factors determining German consumers' intention to eat meat alternatives.* Food Quality and Preference, 100, Food quality and preference, 2022-09, Vol.100.

Mayerhofer, L. (2022). *Veggie-Siegeszug: Rügenwalder Mühle verkauft erstmals mehr Vegetarisches als Fleisch.* Retrieved May 17th, 2022, from https://www.merkur.de/wirtschaft/ruegenwalder-muehle-vegan-vegetarisch-fleisch-toennies-umsatz-gewinn-verkauf-veggie-zr-91521797.html

McEachan, R., Conner, M., Taylor, N., & Lawton, R. (2011). *Prospective prediction of health-related behaviours with the Theory of Planned Behaviour: A meta-analysis.* Health Psychology Review, 5(2), 97-144.

Meiko (n.d.). *Food trends for the future. You are what you cook.* Retrieved February 3, 2022, from https://www.meiko.ca/en_us/meiko-experience/magazine/food-trends

Mintel (2018). *Deutschland dominiert weiterhin bei veganen Produkteinführungen.* Retrieved February 3rd, 2022, from https://de.mintel.com/pressestelle/deutschland-dominiert-weiterhin-bei-veganen-produkteinfuehrungen

Mintel (2019). *Großbritannien löst Deutschland als Spitzenreiter für vegane Produkteinführungen ab.* Retrieved February 3rd, 2022, from https://de.mintel.com/pressestelle/grossbritannien-loest-deutschland-als-spitzenreiter-fuer-vegane-produkteinfuehrungen-ab

Olsen, S. (2004). *Antecedents of Seafood Consumption Behaviour.* Journal of Aquatic Food Product Technology, 13(3), 79-91.

Pandey, S., Ritz, C. & Perez-Cueto, F.J.A., (2021). *An application of the theory of planned behaviour to predict intention to consume plant-based yogurt alternatives.* Foods, 10(1), 148.

Paul, J., Modi, A., & Patel, J. (2016). *Predicting green product consumption using theory of planned behavior and reasoned action.* Journal of retailing and consumer services, 29, 123-134

Pliner, P., & Hobden, K. (1992). *Development of a scale to measure the trait of food neophobia in humans.* Appetite 19, 105–120.

Pohjolainen, P., Vinnari, M., & Jokinen, P. (2015). *Consumers' perceived barriers to following a plant-based diet.* British Food Journal (1966), 117(3), 1150-1167.

Povey, R., Wellens, B., & Conner, M. (2001). *Attitudes towards following meat, vegetarian and vegan diets: An examination of the role of ambivalence.* Appetite, 37(1), 15-26.

ProVeg a (2021). *Anzahl der vegetarisch und vegan lebenden Menschen in Deutschland.* Retrieved December 16th, 2021, from https://proveg.com/de/ernaehrung/anzahl-vegan-vegetarischer-menschen/

ProVeg b (2021). *What consumers want: a survey on European consumer attitudes towards plant-based foods.* European Union's Horizon 2020 research and innovation programme. No 862957.

Rügenwalder a (2022). *Fleischfreie Innovationen.* Retrieved January 30th, 2022, from https://www.ruegenwalder.de/fleischfreie-innovation

Rügenwalder b (2022). *Rügenwalder Mühle ist die vertrauenswürdigste Veggie-Marke Deutschlands.* Retrieved May 17th, 2022, from https://www.ruegenwalder.de/most-trusted-brand-2021

Skopos Group (2016). *1,3 Millionen Deutsche leben vegan.* Retrieved February 3rd, 2022, from https://www.skopos-group.de/news/13-millionen-deutsche-leben-vegan.html

Slade, P. (2018). *If you build it, will they eat it? Consumer preferences for plant-based and cultured meat burgers.* Appetite, 125, 428–437.

Singh, K., Junnarkar, M., & Kaur, J. (2018). *Measures of Positive Psychology: Development and Validation* (Softcover reprint of the original 1st ed. 2016 ed.). Springer.

Skallerud, K., Armbrecht, J., & Tuu, H. (2021). *Intentions to Consume Sustainably Produced Fish: The Moderator Effects of Involvement and Environmental Awareness.* Sustainability, 2021, Vol. 13, Iss. 2.

Statista Consumer Market Outlook. (2021, November 17). *Meat substitute market revenue in Germany 2013–2026.* Retrieved December 11th, 2021, from https://www.statista.com/forecasts/658587/retail-sales-value-meat-substitutes-germany and

https://www-statista-com.ezproxy.hwr-berlin.de/forecasts/658587/retail-sales-value-meat-substitutes-germany

Statista Consumer Market Outlook (2022). *Worldwide meat substitute revenue in 2022, by country (in million U.S dollars).* Retrieved February 3rd, 2022, from https://www-statista-com.ezproxy.hwr-berlin.de/forecasts/1276534/worldwide-meat-substitute-revenue-by-country and https://www-statista-com.ezproxy.hwr-berlin.de/outlook/cmo/food/meat/meat-substitutes/worldwide

Statistisches Bundesamt (2021). *Vegetarische und vegane Lebensmittel: Produktion stieg 2020 um mehr als ein Drittel gegenüber dem Vorjahr.* Retrieved February 3rd, 2022, from https://www.destatis.de/DE/Presse/Pressemitteilungen/2021/05/PD21_N033_42.html

The Hartman Group (2021). *Health & Wellness Across the Globe - July 2021*. Retrieved February 3rd, 2022, from https://www.hartman-group.com/reports/1848694677/health-wellness-across-the-globe and https://www-statista-com.ezproxy.hwr-berlin.de/statistics/1280098/global-non-meat-eaters-by-select-country/

Tania, M., & Tang, X. (2021). *Analysis of Consumer Behavior towards Plant-Based Meat and Dairy Alternatives Market in Sweden.* Dissertation, 1–76.

Tso, R., Lim, A.J., & Forde, C.G. (2020). *A Critical Appraisal of the Evidence Supporting Consumer Motivations for Alternative Proteins.* Foods, 10, 24.

Tuorila, H., Meiselman, H., Bell, R., Cardello, A., & Johnson, W. (1994). *Role of sensory and cognitive information in the enhancement of certainty and liking for novel and familiar foods.* Appetite, 23(3), 231-246.

Tuorila, H., & Hartmann, C., (2020). *Consumer responses to novel and unfamiliar foods.* Current opinion in food science, 33, 1–8.

UEDA, H. (2017). *Impact Evaluation of a School-based Food Education Intervention on Cognitive and Attitudinal Aspects of Children's Dietary Habits.* J. Food Syst. Res, 24, 2–17.

Vermeir, I., & Verbeke, W. (2006). *Sustainable food consumption: Exploring the consumer "attitude - Behavioral intention" gap.* Journal of Agricultural & Environmental Ethics, 19(2), 169-194.

Veganz (2020). *Veganz Ernährungsstudie 2020 Europa.* Retrieved February 3rd, 2022, from https://veganz.de/wp-content/uploads/2020/12/2020-11-27-veganz-ernaehrungsreport-vorabauszug-de-2020.pdf

VuMA. (2021). *Ranking der beliebtesten Marken von Wurst- und Fleischwaren in Deutschland 2020.* VuMA Touchpoints 2022. Retrieved January 27th, 2022, from https://de-statista-com.ezproxy.hwr-berlin.de/statistik/daten/studie/171544/umfrage/beliebte-marken-von-fertigwurst-und-fleischwaren/

Weinrich, R. (2019). *Opportunities for the adoption of health-based sustainable dietary patterns: A review on consumer research of meat substitutes.* Sustainability (Basel, Switzerland), 11(15), 4028.

Wolff-Eisenberg, C. (2016). *Survey Administration Best Practices: Using Incentives Effectively.* Ithaka S+R. Retrieved May 12th, 2022, from https://sr.ithaka.org/blog/survey-administration-best-practices-using-incentives-effectively/

Wyker, Brett A., MS, & Davison, Kirsten K., PhD. (2010). *Behavioral Change Theories Can Inform the Prediction of Young Adults' Adoption of a Plant-based Diet.* Journal of Nutrition Education and Behavior, 42(3), 168-177.

Yadav, R., & Pathak, G. (2016). *Young consumers' intention towards buying green products in a developing nation: Extending the theory of planned behavior.* Journal of Cleaner Production, 135, 732-739.

Yazdanpanah, M., & Forouzani, M. (2015). *Application of the Theory of Planned Behaviour to predict Iranian students' intention to purchase organic food.* Journal of Cleaner Production, 107, 342-352.

8. Appendix

Appendix 1. Questionnaire

Construct/Item	Questions	Source
Attitudes		
AT 1	Consuming meat substitutes is favourable.	Ajzen (1991); Bryant et al. (2019); Pandey et al. (2021); Tania and Tang (2021)
AT 2	I think consuming meat substitutes is environmentally friendly.	
AT 3	I think consuming meat substitutes is beneficial for my health.	
AT 4	I think consuming meat substitutes is better for animal welfare (compared to conventional meat).	
Social Norms		
SN 1	People who are important to me think I should consume meat substitutes.	Skallerud et al. (2021); Ajzen (1991)
SN 2	People who are important to me encourage me to consume meat substitutes.	
SN 3	People who are important to me consume meat substitutes themselves.	
PBC		
PBC 1	It's up to me whether I eat meat substitutes or not.	Lea & Worsley (2003); Ajzen (1991)
PBC 2	I am confident that, if I want to, I can easily consume meat substitutes.	
PBC 3	I think that consuming meat substitutes is a convenient option for me.	
PBC 4	I am confident that meat substitutes are available, if I want to consume them.	
Food Curiosity		
FC 1	I am curious to try out new food products.	Davitt et al. (2021); Hwang et al. (2020)
FC 2	I am interested in new food products and trends.	
FC 3	I like reading about and deepening my knowledge about new food products and trends.	
Sensory Attributes		
PSA 1	I like the smell of meat substitutes.	Pandey et al. (2021); Singh et al. (2016)
PSA 2	I like the taste of meat substitutes.	
PSA 3	I like the structure of meat substitutes.	
Brand Trust		
BT 1	I trust well-known meat product brands (e.g. Rügenwalder Mühle, Gutfried and Wiesenhof).	Rügenwalder b (2022)
BT 2	I like that well-known meat product brands (e.g. Rügenwalder Mühle, Gutfried and Wiesenhof) produce meat substitutes.	
BT 3	I prefer to buy meat substitutes from well-known meat product brands (e.g. Rügenwalder Mühle, Gutfried and Wiesenhof).	
Intention		
INT 1	The likelihood that I will eat meat substitute products in the next month is high.	Pandey et al. (2021); Lea & Worsley (2003)
INT 2	I am planning to eat meat substitute products next month.	
Behaviour		
BV 1	I consume meat substitutes regularly.	Pandey et al. (2021); Ajzen (1991)
BV 2	How often do you consume meat substitutes?*	

Note: *Measurement Scale: Never, Less than once a month, Once a month, Once every 2 to 3 week, Once a week, Once every 2 to 3 days, Every day