Same strategies – different categories: An explorative card-sort study of plant-based proteins comparing omnivores, flexitarians, vegetarians and vegans

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Abstract

Understanding how consumers perceive plant-based proteins in comparison to animal-derived proteins can support the protein transition. Based on categorisation theory, we investigated how different consumers – omnivores, flexitarians, vegetarians and vegans – categorise various sources of proteins. 121 Dutch participants sorted 80 product cards (30 plant-based proteins, 20 animal-derived proteins, 5 hybrids (animal-plant) and 25 non-protein products). Our findings show that with decreasing animal protein consumption, omnivores, flexitarians, vegetarians and vegans become increasingly strict in their categorisations. Omnivores do not separate proteins as strictly as flexitarians, vegetarians and vegans do. Hybrid meat is ambiguous for omnivores and flexitarians. Variations in categorisations give directions to marketers on how to tailor positioning of plant-based proteins in a way that consumers identify and adopt them, to guide and accelerate the protein transition.

Keywords: *Plant-based proteins; Categorisation; Card sort*

Track: *Consumer Behavior*

1. Introduction

Reducing animal-derived meat and dairy consumption is beneficial for the environment and public health (Martin et al., 2020; Taufik et al., 2019). Consumers can substitute animal-derived proteins (i.e., meat, dairy, eggs) with plant-based proteins (Onwezen et al., 2021), though, most consumers neither perceive nor categorise plant-based proteins as attractive alternatives. This may be because plant-based proteins do not fit consumers' habits, health beliefs, social norms or preferences (De Boer et al., 2017; Gonera et al., 2021; Hartmann & Siegrist, 2017). Recent studies reveal that the number of consumers who actively replace part of or all animal-derived proteins with plant-based proteins is increasing (Onwezen et al., 2020; Verain et al., 2020). This is for example noticeable from the number of flexitarians (consumers who deliberately reduce meat consumption frequency) which increased from 13% in 2011 to almost 43% in 2019 in the Netherlands (Dagevos, 2021). Consumers' perceptions, categorisations and expertise about plant-based proteins potentially differs when considering the consumption frequency of plant-based proteins and associated self-identification of consumers in relation to animal-derived protein consumption. This suggests positioning proteins in a way that it fits consumers depending on their diet.

Current supermarket shelf geography serves the lifestyle and expertise of the majority of consumers, without taking possible relevant differences between consumer groups into account. As the majority identifies as omnivores (consumers who consider meat and dairy as normal elements of their diets; Gravely & Fraser, 2018), supermarket geography tends to reflect their lifestyle and values. This includes positioning of plant-based meat alternatives that mimic meat. Although these products tend to be positioned away from animal-derived meat, their presentation generally follows a similar shelf organisation as that of meat, while other protein sources like nuts and legumes tend to be in entirely different grocery departments (Gravely & Fraser, 2018). Positioning all protein sources together might be a relevant categorisation for consumers who reduce or refrain from animal-derived proteins.

To facilitate the growing number of consumers open to consume plant-based proteins as alternatives to meat and dairy, it is relevant to know how these specific consumer groups categorise plant-based proteins. When consumers decide which options to consider during shopping, they depend on their psychological categorisation of products to reduce confusion and to facilitate their comparison and purchasing process (Felcher et al., 2001; Marano-Marcolini & Torres-Ruiz, 2017). Categorisation influences consideration set formation (Felcher et al., 2001) which defines the group of brands or products a consumer takes into consideration when choosing an option (Hoek et al., 2011; Paulssen & Bagozzi, 2005). By learning from

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different consumer groups, we gain understanding of consumer categorisations and choices in the shopping environment.

To understand how consumers categorise plant-based proteins, we use psychological categorisation theory to comprehend how these products are classified by consumers. Humans organize their knowledge about objects they encounter – e.g., plants, animals, foods – automatically and effortlessly (Coley & Betz, 2018). Similarly, consumers categorise new and existing products to comprehend usage information and form an evaluation (Creusen & Schoormans, 2005; Hoek et al., 2011). The underlying assumption of categorisation theory is that categorisation is useful for consumers as it structures knowledge about product categories which simplifies judgement and decision making. Well-developed categories allow consumers to infer product properties by relating information about a perceived product to relevant category information (Loken et al., 2008).

In accordance with categorisation theory, consumers' perception of plant-based meat alternatives depend on how these alternatives relate to other products. Consumers evaluate plant-based meat alternatives by assessing whether they are more (dis)similar to meat (i.e., reference product; Hoek et al., 2011). Until now, previous protein categorisation studies (Chollet et al., 2022; Hoek et al., 2011) do not distinguish between different consumers based on dietary preferences. We add to literature by building on the aforementioned studies to explore whether categorisations differ among consumer groups, by including both plant-based meat and dairy alternatives and by conducting an in-depth assessment of underlying consumer associations.

One mechanism underlying categorisation theory is the categorisation strategy used by consumers. The two most studied categorisation strategies are taxonomic and goal-derived categorisation strategies (Estes et al., 2012; Felcher et al., 2001; Lawson et al., 2017; Loken et al., 2008; Murphy, 2001) and these strategies also seem relevant to distinguish between consumer groups in the context of plant-based proteins. Taxonomic categorisations are based on similar physical external attributes (e.g., appearance, structure, origin) and can be accessed spontaneously (Felcher et al., 2001). An example of a taxonomic categorisation is classifying proteins based on the property of animal-derived (e.g., pork, chicken, beef) versus plant-based origin (e.g., soy, peas, legumes) (Hoek et al., 2011; Ross & Murphy, 1999). Goal-derived categorisations are based on aspects related to the fulfilment of common consumption goals within salient contexts (e.g., meal type, nutritional value, preparation scripts; Felcher et al., 2001). For example, the salience of daily protein intake as consumption goal can lead to a goal-derived categorisation of cow milk and oat drink together (representing animal-derived and

plant-based proteins). Both sources fulfil the need of protein consumption and are therefore in one goal-derived category (Ross & Murphy, 1999), despite the taxonomic difference in origin.

To explore how and with which categorisation strategy different consumers (i.e., omnivores, flexitarians, vegetarians, vegans) categorise proteins, we conducted two studies. Study 1 combines an online card-sorting task (step 1) with a follow-up interview (step 2) to provide in-depth insights. To show robustness of categorisation, Study 2 repeats Study 1 with a physical card-sorting task. We contribute to consumer categorisation literature by giving in-depth knowledge on how different consumers categorise a broad range of (novel) plant-based and animal-derived proteins. Using a theory-based approach, this paper explores whether the use of (taxonomic vs. goal-derived) categorisation strategies and cross-categorisations differ across consumer groups.

2. Method

In Study 1, category representations of plant-based proteins were elicited among 40 respondents using an online free card-sorting task (step 1). An in-depth assessment of the underlying category structure was conducted by follow-up interviews (step 2). In Study 2, 81 respondents conducted the card-sort task in real life. In both studies, participants were presented with a sorted pile of 80 cards (see Figure 1 for an illustration)
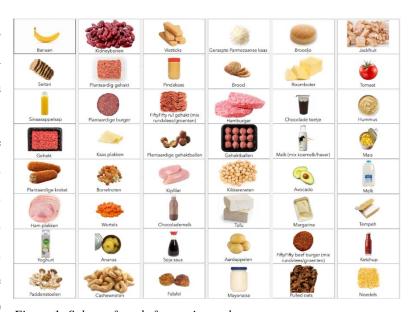

Figure 1: Subset of cards for sorting task

containing a picture and name of a food product. Participants were instructed to sort each card (once) based on their own criteria. Participants were encouraged to speak out loud, free to take as much time and to form as many groups they wanted (more than one and less than 80 to ensure grouping).

To structure the range of plant-based proteins, we chose a range from the various sorts of plant-based proteins currently marketed as food to consumers (Fischer et al., 2023): (1) analogues that mimic animal-derived meat and dairy (e.g., vegetarian burgers, soy drinks), (2) non-analogues that do not mimic animal-derived meat and dairy; (a) processed alternatives (e.g., falafel, tofu) and (b) unprocessed alternatives (e.g., nuts, legumes), and (3) hybrids where

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part of the animal protein is substituted with plant-based proteins (e.g., seaweed-beef burgers and almond-cowmilk). Products included were 55 protein products: 10 animal-derived meat products, 7 plant-based meat analogues, 7 plant-based processed meat non-analogues, 3 hybrid meat products, 10 animal-derived dairy products, 9 plant-based dairy analogues, 2 hybrid dairy products and 7 plant-based unprocessed non-analogues. In addition, 25 non-protein products (e.g., potato crisps, vegetables, drinks) were added.

The card-sort task was analysed in SPSS (IBM SPSS Statistics for Windows, Version 28.0) with a hierarchical cluster analysis (Ward's method) based on pairwise distances (Squared Euclidean distance).

3. Results

Meat and plant-based meat alternatives are separated by all consumer groups. The animal origin seems central in categorising meat and fish, enhancing previous findings that meat as animal-origin product is a separate category from plant-based foods (Blake et al., 2007; Chollet et al., 2022; Hoek et al., 2011; Ross & Murphy, 1999). Yet, we nuance these findings by showing that omnivores split meat and plant-based meat alternatives relatively late compared to other consumer groups (i.e., flexitarians, vegetarians and vegans). The distinction in origin seems less relevant for omnivores, as plant-based meat alternatives are not integrated to omnivorous diets. Similarly, a previously conducted sorting task found that meat and plant-based meat alternatives were perceived to be similar and grouped in the category 'processed meat' (e.g., burgers, sausages) by non-vegetarian consumers (Hoek et al., 2011).

There are clear differences in categorisations of meat and dairy between groups. *Dairy and plant-based dairy alternatives* are grouped together by omnivores, flexitarians and vegetarians, but not by vegans. Compared to meat, the animal-origin of dairy thus seems less important for omnivores, flexitarians and also for some vegetarians. One possible explanation for this finding is the sentiment amongst consumers that animals are not (at least not directly) slaughtered to produce dairy. Vegans strictly separate all animal-derived products from plant-based alternatives. Our findings thus nuance previous literature that approaches "meat reducers" as one consumer group (De Bakker & Dagevos, 2010) and illustrate variation in categorisations between flexitarians, vegetarians, and vegans.

Nuts and beans are not clearly associated with proteins, especially not by omnivores and flexitarians, but also vegetarians and vegans do not readily classify nuts and beans as plant-based alternatives. Nuts and beans are hard to classify more generally as they sometimes were listed among vegetables, and sometimes among a miscellaneous "other" category.

Hybrid meat (i.e., consisting of 50% animal-derived and 50% plant-based ingredients) is shown to be an ambiguous product for omnivores and flexitarians (cf. Bekker et al., 2017, 2021). Hybrid meat is categorised as plant-based meat alternative by omnivores in Study 1 and flexitarians in Study 2. Vegetarians and vegans view hybrids consistently as animal-derived meat. In categorising hybrid meat, the partial plant origin seems more relevant compared to plant-based meat alternatives for omnivores, because hybrids carry a sentiment of a "thinned-out" product. Hybrid meat products are generally targeted at flexitarians (Grasso & Jaworska, 2020) and previous research indicated that flexitarians seem more willing to try hybrid meat products compared to consumers who are not experienced with plant-based proteins (Banovic et al., 2022). Although this previous research suggests flexitarians may be willing to consume hybrid meat, the results of Study 1 suggest that they nevertheless classify it as meat, and that hybrid meat may not contribute to self-set meat reduction goals. *Hybrid dairy* is seen as animal-derived dairy by all groups, but generally, the distinction between animal-derived, plant-based and hybrid dairy is not very salient amongst consumers, except for vegans.

4. Implications

We suggest that marketers and retailers tailor the communication and positioning strategies of plant-based proteins to specific consumer groups (Kerslake et al., 2021), which requires special attention for flexitarians. For instance, marketers can use personalized plant-based product offers (e.g., free trials, recipes) based on previous (online) shopping behaviour.

As preferences within and between consumer groups vary whether animal-derived products should be positioned next to plant-based products, retailers should be cautious in mixing animal-derived with plant-based proteins in one aisle. While including plant-based meat alternatives in a meat shelf may help flexitarians, it may upset vegans. An implication for retailers could therefore be to implement co-existence of categorisation strategies and rely on consumers' ability to cross-categorise by using goal-derived presentations for various types of plant-based products (e.g., use head of shelf to present all ingredients/compartments of a meal, mixing analogues and non-analogues) within taxonomic aisles (where consumers usually go) to increase the chance that more consumers encounter plant-based proteins. While such strategies are difficult to implement in brick-and-mortar stores, given the flexibility of online supermarkets, it would be worthwhile to further investigate positioning strategies of plant-based proteins tailored on consumer profiles, mixing taxonomic and goal-derived positioning.

The limited categorisation of non-analogues (e.g., nuts and beans) as plant-based alternatives to meat and dairy by all consumer groups suggests that marketing effort is needed.

More attention in terms of clear communication and information can raise consumer awareness for these unprocessed non-analogues to be recognized as appropriate proteins across all consumer groups and become part of the protein transition (Lemken et al., 2019).

Hybrids are a complex category for consumers, "neither fish, flesh, nor fowl". Some omnivores will not consider hybrid meat because they view it as plant-based meat alternatives, and vice versa, some flexitarians will not consider hybrid meat because they see it as animal-derived meat which they deliberately aim to reduce. Thus, the effectiveness of hybrid meat as transition product for consumer choice might be debated.

Taxonomic categorisation strategies seem dominant in sorting animal-derived, plant-based and non-protein products for all consumer groups: omnivores, flexitarians, vegetarians and vegans. Specific taxonomies and consideration sets differ between consumer groups. Omnivores separate plant-based meat relatively late from meat, whereas flexitarians, vegetarians and vegans immediately make this distinction. Hybrid meat is ambiguous for omnivores and flexitarians. Consumer groups illustrate clear variations in their categorisations, indicating that tailored marketing strategies are needed to accelerate the protein transition.

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