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THE REASONS AND BARRIERS FOR CONSUMING MEAT ALTERNATIVE PROTEINS: A SYSTEMATIC REVIEW OF THE LITERATURE

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Abstract
One possible solution to face current environmental and health challenges is to replace meat consumption with alternative sources. One option is the so-called plant-based alternatives to meat, products made on a vegetable basis. The market for alternative meat products is growing. Thus, the food industry seeks to produce products that mimic meat. Therefore, it is opportune to bring to the scientific environment studies that analyze consumer behavior of this alternative product to meat. Through a systematic review, to increase knowledge regarding the reasons and barriers that influence the consumer of plant-based alternative foods to meat. Application of the ProKnow-C method. A total of 19 articles were selected. After bibliometric analysis, the journal Appetite, the author Michael Siegrist, and the article "Meatless days" or "less but better"? Exploring strategies to adapt Western meat consumption to health and sustainability challenges" were highlighted in the knowledge area addressed. Knowledge concerning the current scientific research situation about plant-based products. Cover existing gaps in scientific research on consumer behavior of plant-based products.
Keywords: Alternatives to meat, consumer behavior, plant-based.

INTRODUCTION

Historically, meat has occupied a vital role in the daily diet of humans, particularly in Western cultures (He et al., 2020). It is remarkable how this food has been widely sought after and consumed (Hwang et al., 2020). Projections indicate a 70% increase in its consumption by 2050 (Boer et al., 2014). However, this information raises concerns, given the adverse consequences of meat production and consumption on the environment and human health (Carlsson et al., 2022). In addition, it is worth noting that, when compared to vegetable production, meat production is less efficient (Van Loo et al., 2020).

Therefore, the food industry has been seeking to introduce alternative products to meat with the same appearance, texture, and flavor but produced from non-animal proteins (He et al., 2020; Zhao et al., 2022). Thus, it is currently possible to find several products analogous to meat in the market: cultured meat (produced in the laboratory), meat based on fungi, meat based on insects, and meats based on plants (Michel et al., 2021), whose consumption will be the focus of this literature review.

Plant-based meat alternatives, a new generation of meat substitutes, have appeared on the market to meet consumers' demand for food that convincingly imitates meat. These foods are produced from proteins extracted from vegetables and undergo appropriate structuring processes (He et al., 2020). They have texture, appearance, nutritional information, aroma, and, most importantly, a taste similar to meat (Zhao et al., 2022). However, it is not easy to persuade consumers to choose plant-based products over traditional meat (He et al., 2020). Thus, it is crucial to understand the consumption profile of those inclined to reduce meat consumption, whether vegans, vegetarians, or omnivores (Beacom et al., 2021).

The search for plant-based foods as alternatives to meat can be motivated by self-centered factors, in which consumers primarily consider their own interests, such as concern for health, or by empathic factors, in which motivation is related to the well-being of other people, the animal cause, or environmental issues (Bakr et al., 2022). These factors can significantly influence consumers' relationship with plant-based foods (Bakr et al., 2022). Understanding the factors that affect consumers of plant-based foods as alternatives to meat is essential to identifying and reaching them. This will help us analyze the most relevant issues shaping the behavior of this consumer group (Beacom et al., 2021) and provide subsidies for product development and marketing aimed at the target consumer (Kemper, 2020).

The emergence of sustainable and ethical products, such as plant-based alternatives to meat, requires understanding the purchasing behavior of these products since such types of products require different marketing strategies. Marketing acts not necessarily to reduce excessive consumption but to help create, market, and persuade consumers to buy sustainable and ethical products (Groening et al., 2018).

Thus, this article aims to expand scientific knowledge about the motivators and barriers that influence the consumption of plant-based alternatives to meat. We selected and qualified the scientific production of the last ten years. To achieve this objective, we have outlined two specific goals: to select relevant bibliographic sources on the motivators and barriers that influence the consumption of plant-based alternatives to meat and to conduct bibliometric analyses of the selected articles and their references.

Therefore, we chose the constructivist method of Knowledge Development (Proknow-C) as a tool. Proknow-C assists the researcher in building knowledge through the structured selection and analysis of the literature that comprises the theme of interest (Lacerda et al., 2012).

LITERATURE REVIEW

Consumer behavior is always a relevant topic for research since, as consumers, individuals are constantly exposed to and influenced by new forms of consumption. They also influence companies and their marketing strategies. Understanding consumers implies understanding their needs. Many of the fundamental marketing principles derive from the professional's ability to understand people. After all, if it is impossible to understand why people behave in a certain way, it

will not be possible to identify their needs and, consequently, it will not be possible to satisfy them (Solomon, 2016; Kotler & Keller, 2012, Engel et al., 2000).

In recent years, there has been a growing interest in research on changes in eating habits, especially concerning vegan foods, among them plant-based alternatives to meat. These have been the most focused by researchers (Graça et al., 2019; Bakr et al., 2022). Many studies analyzing consumers of this type of product were found in the literature (Gravly & Fraser, 2018; Hoek et al., Engels et al., 2011; Schösler et al., 2014). They focus primarily on understanding consumer acceptance of plant-based alternatives to meat. Van Loo et al. (2020) sought to understand the reasons for choosing and willing to pay. Graça et al. (2019) studied the barriers and facilitators of consumption. Apostolidis and Mcleay (2016) aimed to identify the attributes influencing choices. Hartmann and Siegrist (2017) researched consumers' willingness to replace meat with alternative products. However, few studies seek to understand the factors influencing the intention to purchase plant-based alternatives to meat (Aschemann-Witzel et al., 2020; Peschel et al., 2019; Beacom et al., 2021).

The increase in the number of researches concerning plant-based alternatives to meat products can be attributed to the fact that this type of food has gained significant attention from consumers, especially those concerned with ethical, environmental, and health issues. As already seen earlier, the search for plant-based foods as alternatives to meat can be motivated by self-centered or empathic factors. These factors can significantly influence consumers' relationship with plant-based food (Bakr et al., 2022) and the way the product is presented to the consumer (Peschel et al., 2019). Plant-based eating is inextricably linked to several factors beyond the simple act of eating. Environmental concerns, animal welfare, health awareness, the influence of reference groups, price, food neophobia, and attachment to meat are among the reasons and barriers that influence the consumption of plant-based foods alternative to meat (Miguel et al., 2020; Bakr et al., 2022).

Contemporary consumers demonstrate a growing search for well-being and healthy eating practices, preferring balanced diets and opting for hedonic foods in which flavor and nutrition coexist harmoniously (Miguel et al., 2020). The search for health maintenance leads individuals to give up certain foods due to low nutritional value. Such changes in consumption behavior result from the transformation in attitudes towards these foods. This behavioral change extends to eating outside the home. Even in restaurants, individuals are aware of their health and maintain their options for more nutritious foods (Beacom et al., 2021).

Therefore, health awareness emerges as a crucial predictor of healthy attitudes and behaviors (Gould, 1990). In other words, this awareness is intrinsically linked to health information and strongly influences attitudes towards specific products. Thus, consumers directly associate a healthy quality of life with healthy eating practices. Health-conscious individuals are more self-conscious about their well-being (Van Loo et al., 2020). Food nutrition becomes critical in purchasing attitudes and decisions when prioritizing health concerns (Bakr; Al-Bloushi; Mostafa, 2022).

Environmental concern is the degree to which people are aware of environmental issues and apply efforts to solve them or indicate a willingness to contribute to their solution (Dunlap & Jones, 2002). Research has shown that environmental concerns directly influence consumers' attitudes toward green products and plant-based diets (Bakr et al., 2022). Studies such as that of Beacom et al. (2021) revealed that environmental concern is one of the most prominent motivations for consuming plant-based alternatives to meat. They indicate that environmental concern is correlated with sociodemographic characteristics, such as gender and income. Women, like those with higher incomes, tend to show more significant environmental concern. These concerns influence consumers' attitudes, purchasing behaviors, and lifestyles (Miguel et al., 2020).

Animal welfare is a growing concern that directly impacts people's food choices and lifestyles. It is defined as the quality of life of animals concerning their living conditions, feelings, and environments. Concern for animal welfare is expressed in the "five freedoms," which define expectations for animals under human control. They are freedom from hunger, freedom from fear and anguish, the absence of thermal stress or physical discomfort, freedom from pain, injury, and disease, and freedom to express normal behavior patterns (Miguel et al., 2020).

Consumers who value animal welfare are less likely to consume meat, demonstrating how attitudes toward animal welfare can strongly predict dietary behavior. In summary, animal welfare concerns are crucial in people's food choices and lifestyles, reflecting broader ethical and moral values regarding treating animals and the environment (Chen & Deng, 2016; Luo & Yuan, 2011; Miguel et al., 2021).

Given that eating is a social activity in which individuals come together to share meanings and experiences (Markowski & Roxburgh, 2019), the choice for a diet with meat restriction may also be strongly influenced by the pressures of reference groups, composed of family, friends, social media influencers, and celebrities (Janssen et al., 2016; Phua et al., 2019). These reference groups exert influences in various ways, directly and indirectly impacting individuals' feelings, views, and attitudes, eventually inducing significant behavioral changes (Markowski & Roxburgh, 2019).

According to Graça, Calheiros, and Oliveira (2015), "attachment to meat" is one of the primary barriers to the consumption of plant-based alternatives to meat. They define attachment to meat as being the emotional bond that exists between consumers and meat consumption. Another barrier indicated by the authors is food neophobia. Food neophobia, characterized by the aversion to unfamiliar foods, represents a significant barrier to experimentation with new food products, including meat substitutes (Bakr et al., 2022). This aversion is commonly seen as an obstacle to accepting meat alternatives, such as plant-based foods, cultured meat, and other insect-based substitutes. Studies have shown that consumers with a negative attitude toward plant-based diets generally have high food neophobia, resulting in a lower propensity to acquire plant-based foods (Michel et al., 2021).

Thus, the inclination of consumers to meet their needs and be active in purchase decisions shows that purchase intention is triggered by emotions, causing consumers to establish meaningful connections with brands, products, and services. As such, it is essential to explore the connection between factors that influence a diet with reduced meat consumption to purchase plant-based foods alternative to meat since these factors can intensify and mitigate the consumption of such products (Chen & Deng, 2016; Luo & Yuan, 2011; Miguel et al., 2021).

METHOD

For researchers to define their research objectives, following theoretical or empirical approaches within this vast and complex field of science, it is fundamental to identify the current stage of knowledge within the area of knowledge of their interest (Kraus et al., 2022). Reviewing academic literature is necessary for this identification since the activities involving literature analysis can help the researcher to:

i. Obtain scientific support for their work based on what has been published on the subject of interest;
ii. Justify the choice of topic and the contribution of their research proposal;
iii. Generate a justification for their methodological framework;
iv. Narrow the scope of the research, making it a feasible project;
v. Develop the researcher's skills in critically analyzing the literature and treating comprehensive and dispersed information.

Thus, we conducted this bibliographic survey to catalog relevant studies that address the theme reasons and barriers to consuming proteins alternative to meat, using the PROKNOW-C, Knowledge Development Process-Constructivist as a literature review method (Ensslin et al.,2010)

The PROKNOW-C method is structured so that the researcher develops a bibliographic portfolio within their field of interest, considering the limitations and intrinsic specificities. The articles selected for this portfolio are scientifically recognized and related to the research theme (Lacerda et al., 2012). PROKNOW-C is a method widely used in the scientific community. It consists of three primary steps: selecting the article portfolio, bibliometric analysis, and article classification according to academic relevance (Ensslin et al.,2010).

In the first stage of this research, a search was conducted in databases of articles relevant to the topic of interest. The one aligned with the research was selected, considering the specific characteristics of the theme in focus; in this case, the reasons and barriers to consuming proteins as an alternative to meat. The second stage, which involved bibliometric analysis, aimed to identify the relevance of the articles in the portfolio based on the number of citations, journals, and authors who publish studies related to the theme. In the third stage, the articles were classified according to academic relevance in the sample through selected evaluation criteria (Ensslin et al.,2010).

FINDINGS AND DISCUSSION

This section aimed to detail the procedures used in selecting articles to build the theoretical framework and perform the bibliometric analysis of the portfolio of selected articles that comprise this review. Thus, we will divide this section into three subsections: preliminary investigation, selection of articles composing the research portfolio, and bibliometric analysis of the article portfolio for the theoretical framework.

Preliminary investigation

About the research chronology: The procedures described below were performed in September 2023.

About the database: This bibliometric review was conducted using the Scopus scientific database due to its reputation as one of the largest multidisciplinary databases, covering several fields of knowledge, including the social sciences. The Elsevier Scopus search engine was also used to locate pages with scientific content (Mesquita et al., 2006). Thus, it is understood that the selected database is the most appropriate for conducting the proposed study.

Table 1
Definition of the research keywords

KW combinations			
Axis 1		*Axis 2*	*Articles*
"consumer"	AND	"meat alternative"	170
"consumer"	AND	"alternative protein"	159
"consumer"	AND	"meat substitutes"	187
"consumer"	AND	"plant-based"	89
"consumption"	AND	"meat alternative"	164
"consumption"	AND	"alternative protein"	173
"consumption"	AND	"meat substitutes"	175
"consumption"	AND	"plant-based"	84

	TOTAL	1201

Source: Research data.

About the keywords: Once the sample field was defined, we chose the keywords that form the first filter for the article selection. Two central axes were defined within the theme of the reasons and barriers to consuming proteins as an alternative to meat. “Consumer behavior" was chosen as the first axis, and "eating habits" as the second. These themes guided the selection of keywords, which were combined and entered into the database. In other words, word combinations were defined, consisting of one word from each axis, used to select the gross base of articles for the beginning of the article selection activities for this bibliometry, as observed in Tablet 1.

Selection of articles that will comprise the research portfolio

Initially, the keywords that would form the basis of the sample field were defined. Article selection to compose the portfolio and build the theoretical framework of the research took place between August 16th, 2023, and September 10th, 2023.

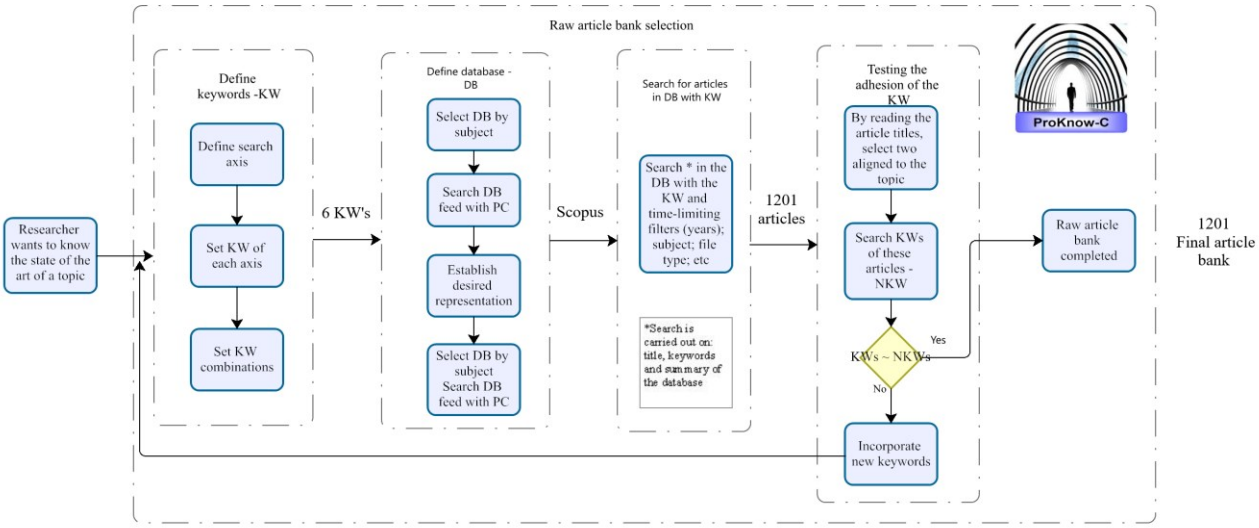

Figure 1. First fragment of the article selection.
Source: Adapted from Lacerda, Ensslin, and Ensslin (2012).

The keywords in Chart 1 were used as criteria, restricting the search to articles and publications between 2013 and 2023. The Scopus database was consulted after defining the word combinations, one from each axis. Thus, 1201 articles were obtained, as shown in Figure 1.

After importing these references into the Mendeley application, 176 duplicate references were identified and deleted, resulting in a library of 1025 articles up to this point in the selection process. The titles of these 1025 references were analyzed to assess their relevance to the research. After this analysis, 719 references were excluded due to misalignment with the research, resulting in 306 remaining references (Figure 2).

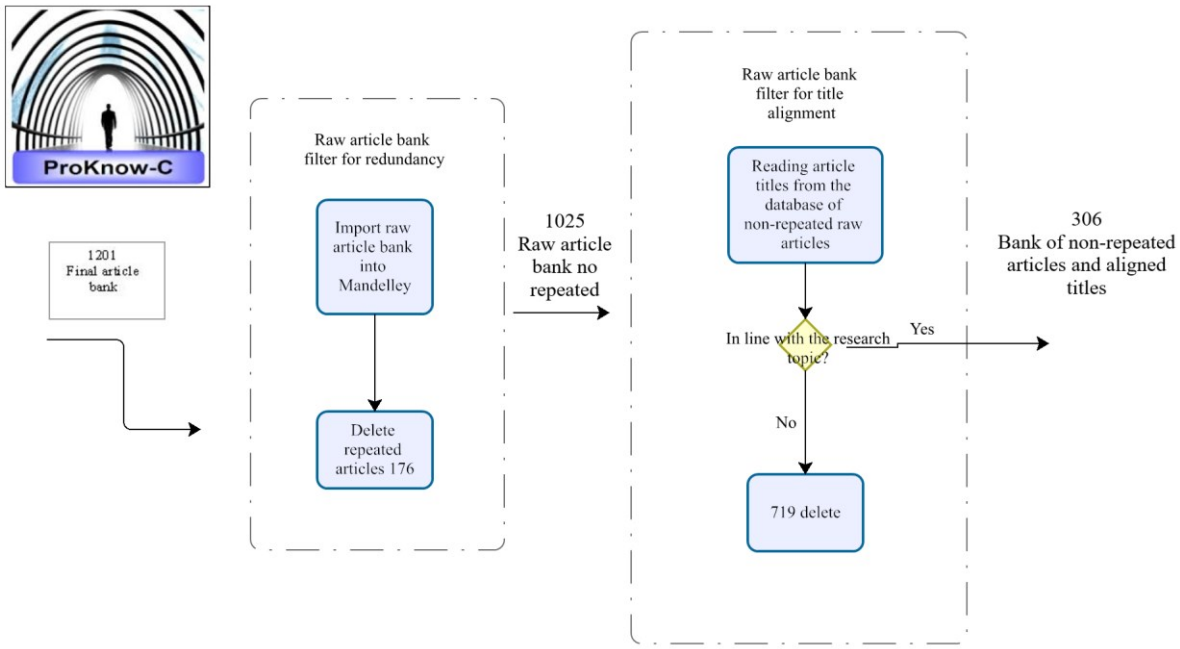

Figure 2. Second fragment of the article selection.
Source: Adapted from Lacerda, Ensslin, and Ensslin (2012).

These 306 references, whose titles aligned with the research theme, were analyzed regarding scientific recognition from the publication date. Google Scholar was consulted to verify the number of citations of each reference, after which they were ordered in descending order. Based on this information, a cut-off value was established for the most cited articles. This was grounded in the generalization by Juran (1997) of the postulate by Pareto (1896), which suggests that a small minority of the population accounts for most of the effect. In this context, this means that few of the most cited articles represent the majority of the scientific recognition in the sample.

Thus, the established cut-off value was 30 citations. An article was selected for the portfolio when its citations exceeded 30, that is, they represented over 80% of the total citations obtained by the 306 articles analyzed. With this criterion, 76 articles were selected based on the number of citations, as shown in Figure 3. It is important to emphasize that the 229 least cited articles would still undergo an additional analysis with different criteria so that they could still be included in the final portfolio that will compose the theoretical framework of the research.

After selecting the most cited articles, the alignment of their abstracts with the research focus was evaluated. Of the 76 abstracts analyzed, 41 were excluded due to misalignment with the research object. There are 35 articles that:

i. Were aligned with the theme based on the reading of the title and abstract;

ii. Had a significant volume of citations.

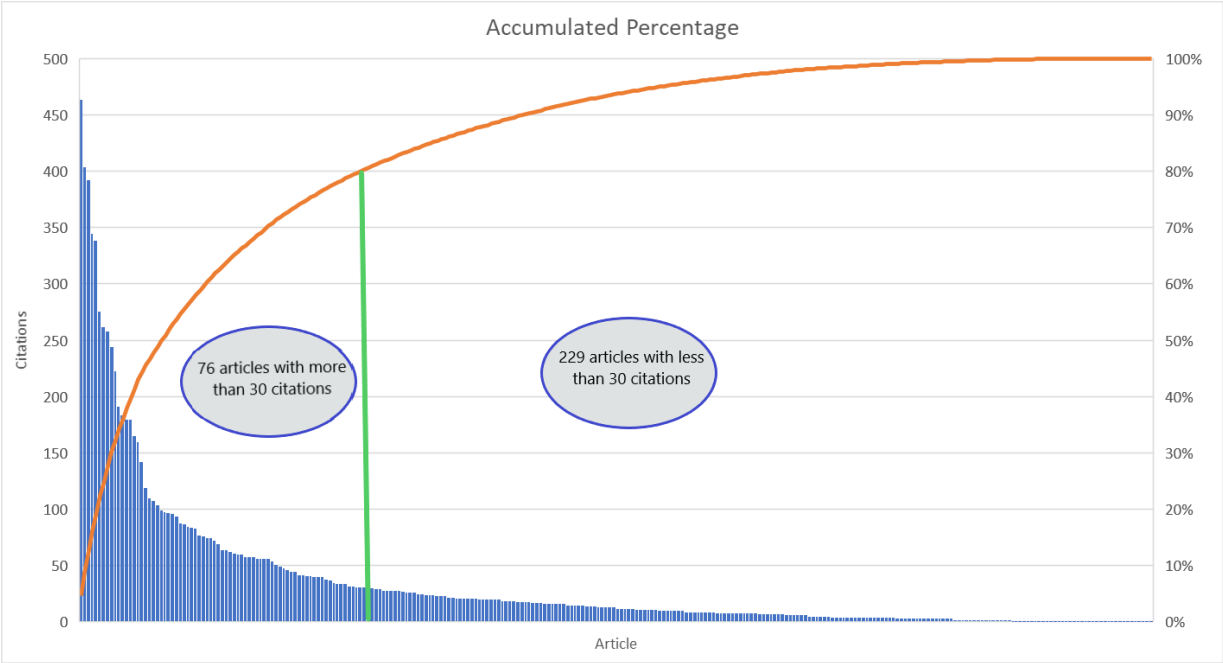

Figure 3. Evidence of the cut-off value according to its citations.
Source: Research data.

These 35 articles were chosen to form the basis of the theoretical framework on the reasons and barriers to plant-based food consumption alternatives to meat. However, additional analysis was required for the 229 least cited articles, which could still be part of the final portfolio. The condition for an article with fewer citations to be included in the final research portfolio was that it should have been published in the last two years of the analysis, considering that it has not yet had the opportunity to be widely cited. With this condition in mind, of the 229 articles analyzed in the recap, 127 were published in 2021, 2022, or 2023. Seven were selected after reading their abstracts, given that alignment with the research object is fundamental for inclusion in the final portfolio.

Figure 4 illustrates the reanalysis process and shows the number of articles that passed each stage of the selection process.

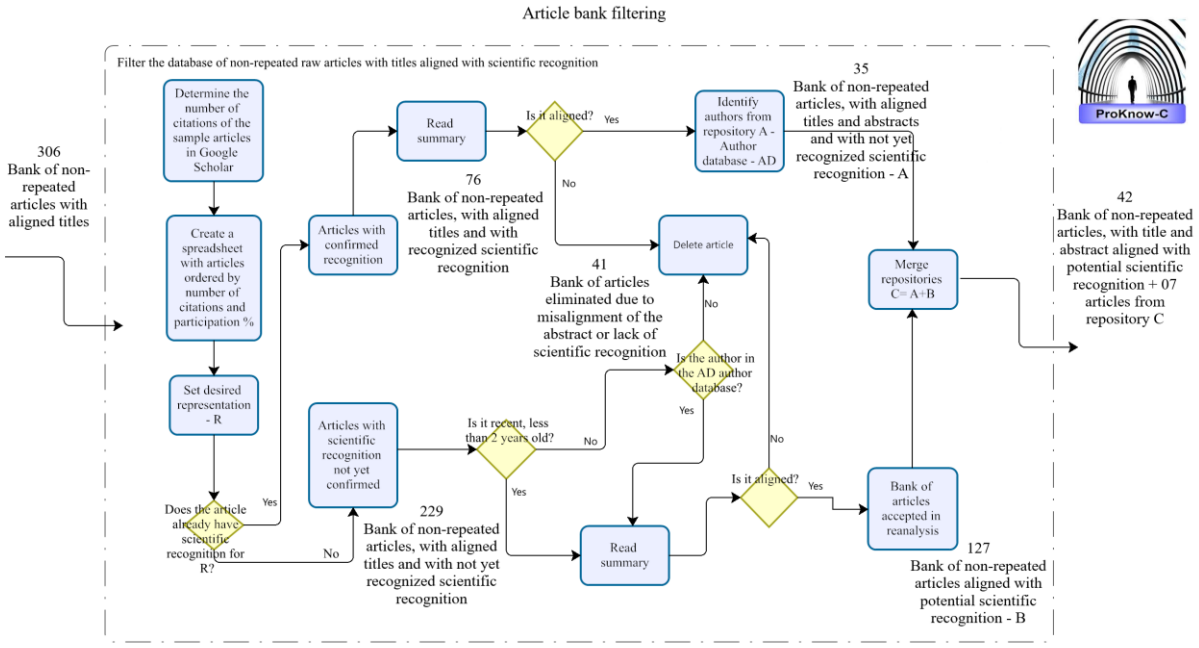

Figure 4. Third fragment of the article selection.
Source: Adapted from Lacerda, Ensslin, and Ensslin (2012).

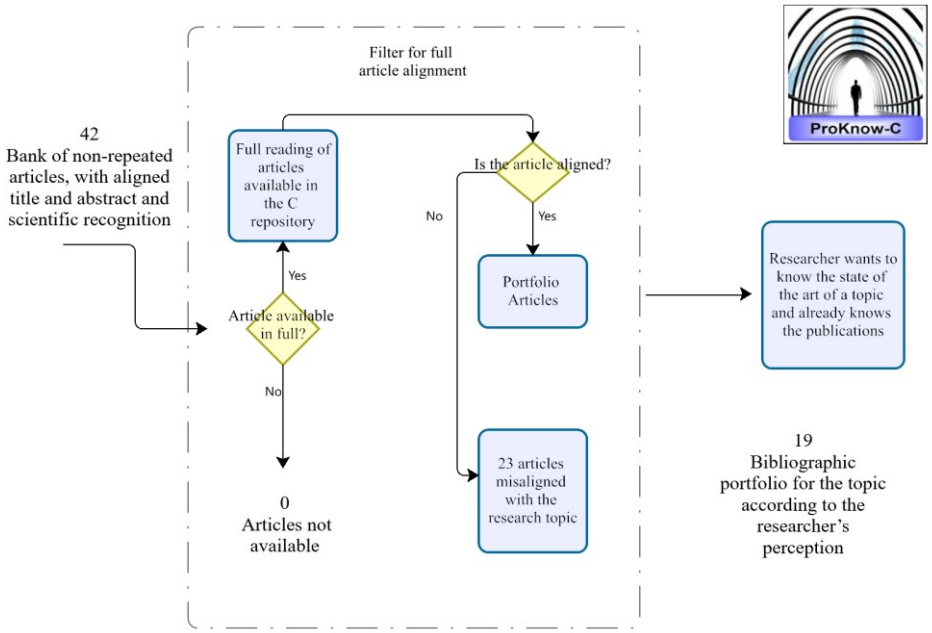

Figure 5. Third fragment of the article selection.
Source: Adapted from Lacerda, Ensslin, and Ensslin (2012).

Seven articles were selected after reanalysis of the least cited articles and added to the 35 articles previously chosen, totaling 42 articles for the final portfolio. When reviewing the abstracts of these 42 articles, all were aligned with the research in question. However, as a last step, the articles were read fully to ensure their alignment with the theme. Thus, of the 42 articles initially selected, 23 were excluded due to misalignment with the research theme.

Table 2
Articles that form the portfolio of articles to compose the theoretical framework

Citations	*References*	*Authors*
392	Meatless days or "less but better"? Exploring strategies to adapt Western meat consumption to health and sustainability challenges	De Boer *et al.,* 2014
339	Should we stop meating like this? Reducing meat consumption through substitution	Apostolidis & McLeay, 2016
276	Consumers' associations, perceptions and acceptance of meat and plant-based meat alternatives	Michel *et al.,* 2021
262	A review of research on plant-based meat alternatives: Driving forces, history, manufacturing, and consumer attitudes	He *et al.,*2020
223	Consumers' perceived barriers to following a plant-based diet	Pohjolainen *et al.,*2015
165	Exploring meat substitutes: Consumer experiences and contextual factors	Elzerman *et al.*, 2013
104	Fostering more sustainable food choices: Can Self-Determination Theory help?	Schösler *et al.*, 2014
97	Motivations, barriers, and strategies for meat reduction at different family lifecycle stages	Kemper, 2020
96	Factors affecting consumers' alternative meats buying intentions: Plant-based meat alternative and cultured meat	Hwang *et al.*, 2020
87	Responding to food, environment and health challenges by changing meat consumption behaviours in consumers	Stubbs *et al.*, 2018
75	Identifying barriers to decreasing meat consumption and increasing acceptance of meat substitutes among Swedish consumers	Collier *et al.*, 2021
62	The Role of Plant-Based Foods in Canadian Diets: A Survey Examining Food Choices, Motivations and Dietary Identity	Clark & Bogdan, 2019
41	Towards more environmentally sustainable diets? Changes in the consumption of beef and plant- and insect-based protein products in consumer groups in Finland	Niva & Vainio, 2021
40	Alternative food consumption (AFC): idiocentric and allocentric factors of influence among low socio-economic status (SES) consumers	Batat *et al.*, 2017
37	How much does it take? Willingness to switch to meat substitutes	Carlsson et al., 2022
31	What's your beef with meat substitutes? Exploring barriers and facilitators for meat substitutes in omnivores, vegetarians, and vegans	Kerslake et al., 2022
31	Market-oriented Development of Plant-based Food and Beverage Products: A Usage Segmentation Approach	Beacom et al., 2021
20	Meat Substitutes in Sustainability Context: A Content Analysis of Consumer Attitudes	Tosun et al., 2021
20	Coping with multiple identities related to meat consumption	Randers et al., 2021

Source: Research data.

Figure 5 provides a graphical representation of the procedures and number of final activities for composing the final portfolio. The 19 articles are organized in descending order of citations, as shown in Table 2.

Bibliometric analysis of the selected articles

The bibliometric analysis of the 19 selected articles was performed considering three aspects:

i. Scientific recognition by the number of citations; ii. Number of articles per journal; iii. Number of articles per author.

Below are the results of the analysis of these aspects.

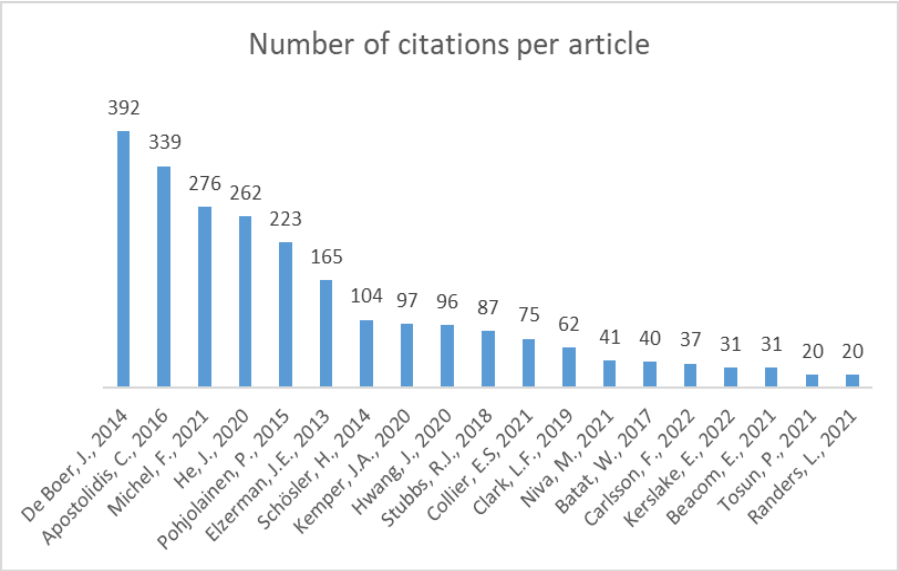

Figure 6. Number of citations in the references per article.
Source: Research data.

The following articles stood out for scientific recognition based on the number of citations: Meatless days or "less but better"? Exploring strategies to adapt Western meat consumption to health and sustainability challenges (De Boer et al., 2014) and Should we stop meating like this? Reducing meat consumption through substitution (Apostolidis & McLeay, 2016), as observed in Chart 2 and Figure 6.

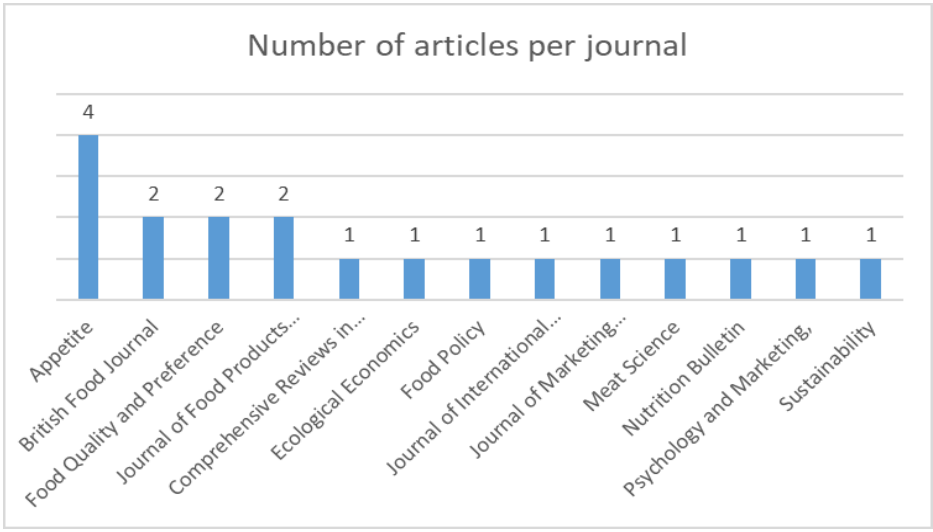

Figure 7. Number of articles per journal.
Source: Research data.

The journal Appetite is highlighted, with four indexations in the sample. However, the British Food Journal, Food Quality and Preference, and Journal of Food Products Marketing also showed some relevance, with two articles each among those selected for the bibliographic portfolio, as observed in Figure 7.

Researchers Hanna Schösler, Joya A. Kemper, and Joop de Boer presented two of their articles selected for the final portfolio as authors or co-authors. The remaining authors had only one article selected, as shown in Figure 8.

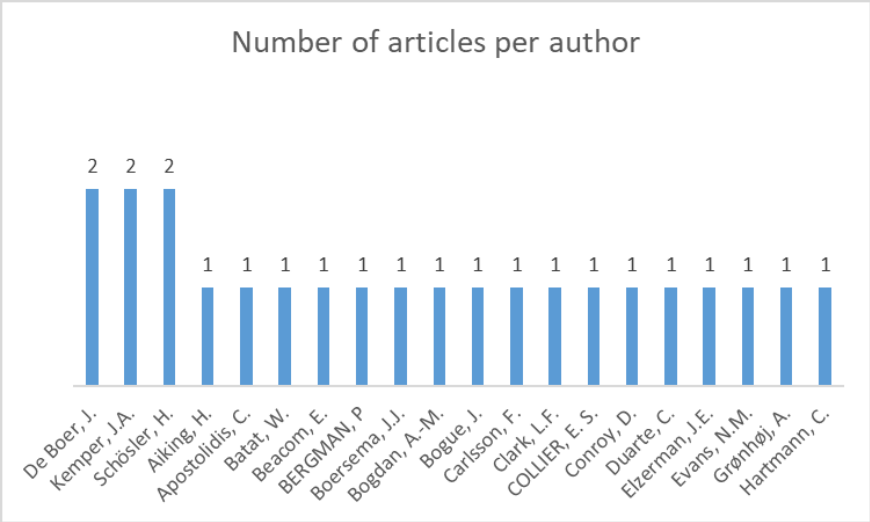

Figure 8. Number of articles per author.
Source: Research data.

Bibliometric analysis of the references of selected articles

A total of 665 references cited by the 19 articles comprising the final portfolio were cataloged to identify the authors, articles and journals highlighted in the context of the research on the agenda. These 665 references were analyzed from the following perspectives: i. Number of citations in the references per article; ii. Number of articles per author. Analyzing bibliographic references of the final portfolio demonstrated the contributions of Michael Siegrist, Joop de Boer, and Klaus G. Grunert, specifically for their publications on the factors that influence the consumption of alternative foods, as seen in Figure 9.

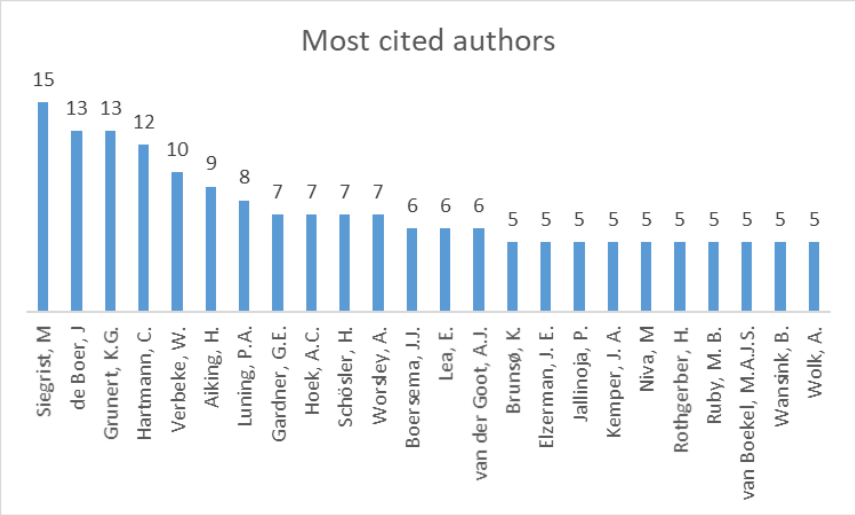

Figure 9. Most cited authors in the references.
Source: Research data.

However, despite his relevance, Grunert's articles were not selected for the analyzed sample due to the time cut adopted for this research. Appetite Magazine published the most articles on the consumption of plant-based alternatives to meat. The British Food Journal, Meat Science, and Journal of Consumer Research also stood out, with a considerably smaller but still expressive volume, as shown in Figure 10.

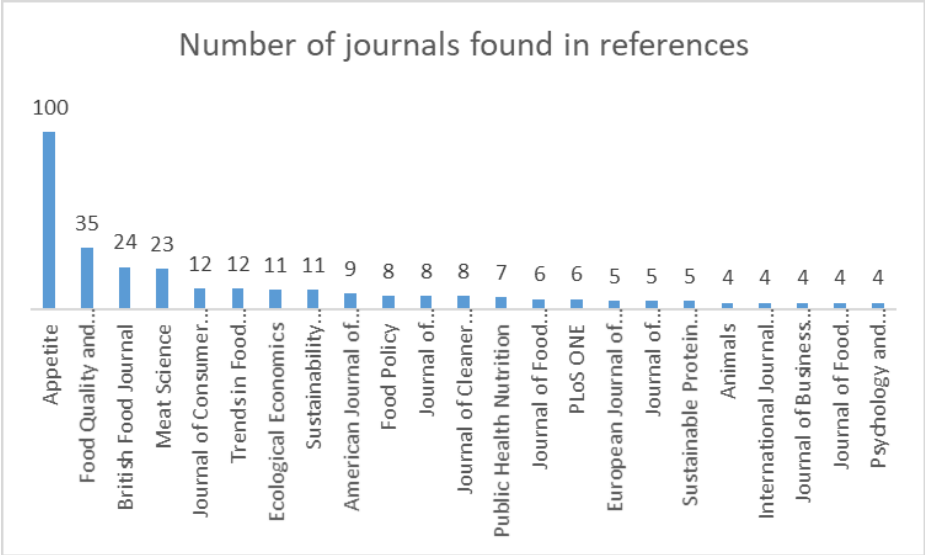

Figure 10. Number of journals found in the references.
Source: Research data.

Classification of articles according to academic relevance in the sample

This study employed two evaluation criteria to determine the academic relevance of the articles in the portfolio: the number of citations obtained by the article since its publication in Google Scholar and the number of citations of the most referenced author, as analyzed in the previous section.

Based on this analysis, Figure 11 shows a graph representing the two dimensions used to classify the articles according to their academic relevance, highlighting those that stood out in this evaluation. The quadrants were defined by selecting the three most outstanding articles in each dimension, equivalent to approximately 10% of the total number of articles in the final portfolio.

Crossing the data of the portfolio and its references showed that the article entitled "Should we stop meating like this? Reducing meat consumption through substitution" (Apostolidis & McLeay, 2016) stands out significantly in the context of the theme addressed. On the other hand, the articles "Meatless days or 'less but better'? Exploring strategies to adapt Western meat consumption to health and sustainability challenges" (De Boer et al., 2014) and "Consumers' associations, perceptions and acceptance of meat and plant-based meat alternatives" (Michel et al., 2021) also stood out regarding the importance of their authors and the scientific recognition evidenced by the number of citations.

Apostolidis & McLeay (2016) analyzed consumer preferences for meat characteristics and substitutes, identifying consumer segments based on these preferences. We found that price, nutritional content, and country of origin are crucial for consumer choice. Other elements, such as environmental concerns and branding, play a less significant role. Latent class analysis was used to identify six groups of consumers with different profiles and patterns of meat consumption (price-conscious consumers, healthy consumers, taste-oriented consumers, and green, organic, and vegetarian consumers, with different sociodemographic characteristics and patterns of meat consumption). In conclusion, future interventions and policies to reduce meat consumption should be targeted at specific consumer segments, using holistic strategies that include labeling, provision of additional information, financial incentives, educational campaigns, and new product development.

On the other hand, De Boer et al. (2014) addressed the food, environmental, and consumption challenges, proposing strategies for change, such as reducing the size of meat portions, opting for

more sustainable meat production, incorporating more vegetable protein, and adopting meat-free meals. We analyzed the food choices of 1,083 Dutch consumers to understand current practices and possible changes and found that different strategies can attract different consumer segments and that these complementary approaches can facilitate gradual changes in eating habits.

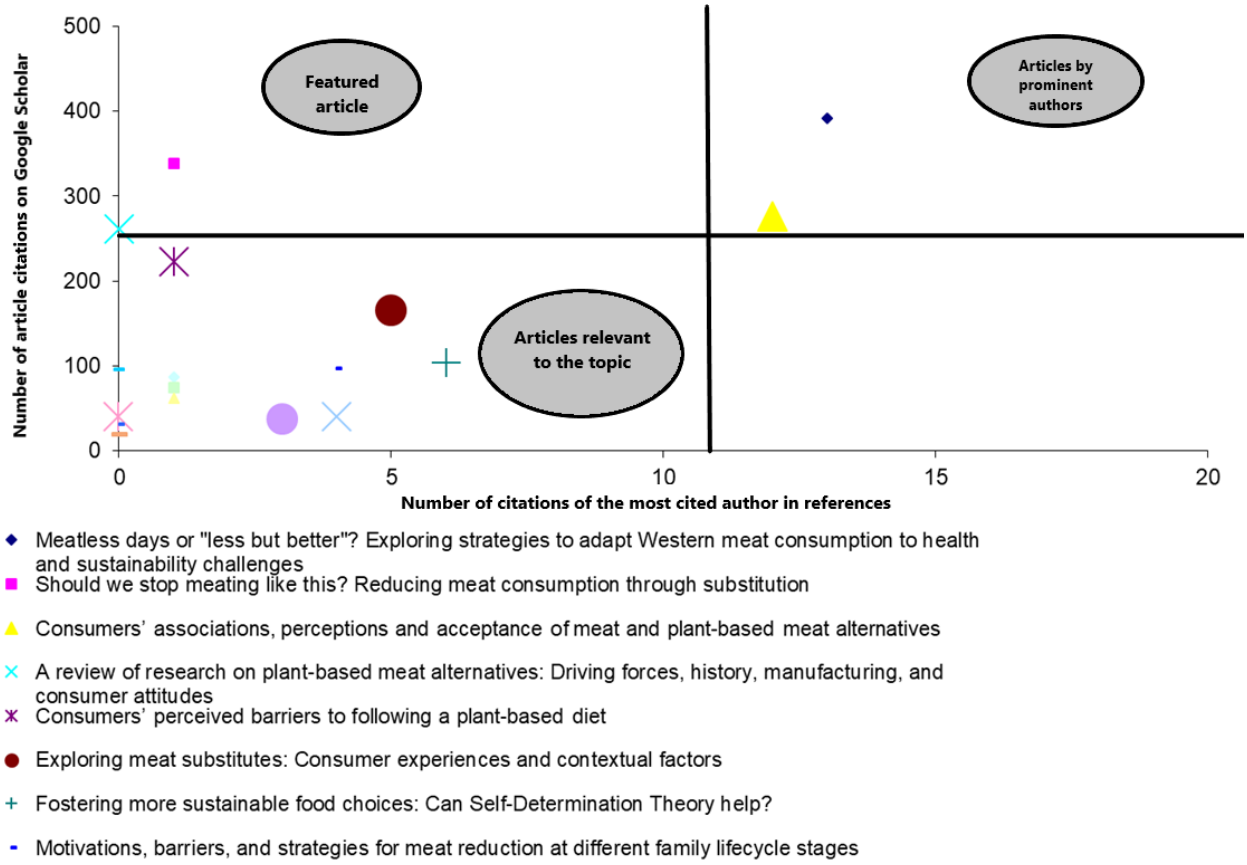

Figure 11. Classification of articles according to their academic relevance.
Source: Research data.

Finally, Michel et al. (2021) sought to identify barriers to consuming meat alternatives and promote their future acceptance. An online survey was conducted with 1039 participants in Germany, demonstrating that meat alternatives are perceived more negatively than meat. Still, they must resemble processed meat in taste, texture, and ease of preparation. In addition, the consumption of meat alternatives is more appropriate in social situations. Thus, meat alternatives are more likely to succeed when they replicate highly processed meat products and are offered at competitive prices.

CONCLUSIONS

This study's proposal focused on identifying and analyzing a set of references given the increasing importance of reducing meat consumption, the rapid growth of the market for plant-based meat alternatives, and the fundamental influence of the study on consumer behavior in the promotion of successful markets, to build a theoretical base that contributes to the theme, highlighting the selection process of scientific articles most relevant to the topic. In addition, a bibliometric study of these references was performed using the Proknow-C tool.

Articles, authors, and journals of relevance to the theme were identified after analyzing 1201 papers, resulting in a portfolio of 19 scientific articles through a systematic selection process, as demonstrated in this study. The graphs resulting from this study concerning the articles in the bibliographic portfolio highlighted the journal Appetite, the researchers Hanna Schösler, Joya A. Kemper and Joop de Boer, with two of their articles selected for the final portfolio, and the article

Meatless days or "less but better"? regarding scientific recognition by the number of citations. Exploring strategies to adapt Western meat consumption to health and sustainability challenges (De Boer et al., 2014) was highlighted.

Analyzing the references showed that, in addition to Appetite, which also maintained its prominence among the reference citations, the journals British Food Journal, Meat Science, and Journal of Consumer Research presented many publications on the consumption of plant-based alternatives to meat. The contributions of Michael Siegrist, Joop de Boer, and Klaus G. Grunert were highlighted.

Crossing the analyses performed in the portfolio and its references, we identified the article "Should we stop meating like this? Reducing meat consumption through substitution" (Apostolidis & McLeay, 2016) stands out regarding the theme addressed here. In contrast, the articles Meatless days or "less but better"? Exploring strategies to adapt Western meat consumption to health and sustainability challenges" (De Boer et al., 2014) and "Consumers' associations, perceptions and acceptance of meat and plant-based meat alternatives" (Michel et al., 2021) stood out regarding the importance of their authors and the scientific recognition evidenced by the number of citations.

In conclusion, this evaluation of scientific production concerning the reasons and barriers to consuming proteins as an alternative to meat aims to guide and improve future investigations on the subject. The objective is not to establish a conclusive theoretical framework but to propose a structured process of knowledge construction. For subsequent agendas, a content analysis of the selected portfolios is essential to identify potential gaps in the literature and opportunities for future research.

Limitations and future research

It is essential to highlight that this research has limitations when considering exclusively scientific articles indexed in the Scopus database, dated between 2013 and 2023.

Research ethic statement

The authors declare that this study no submitted for evaluation in another journal simultaneously with the CBR or previously published in another journal.

Author contribution statement

The authors contributed equally to the paper.

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