Building a Future Research Agenda for Reducing Meat Consumption: A Review on Social Norms, Food, and Drink*

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Abstract: Scientific studies have indicated the need for sustainable diets that reduce or exclude meat consumption to address the climate crisis. However, new dietary patterns require challenging changes in consumer behavior, and social norms can be a means to achieve this. This study aims to provide a future research agenda on meat consumption and social norms based on an overview of quantitative empirical research related to social norms and food and beverage consumption behavior. We seek to fill a gap in the literature by relating a consolidated and widely used theory in behavioral interventions to a topic of current academic and social attention. From a systematic review of peer-reviewed articles, we identified interpretable patterns, including theories, methodologies, geographic focus, year of publication, samples, and demographic variables. Our results highlighted investigations conducted in the United States, using the Focus Theory of Normative Conduct as a theoretical lens and involving undergraduate students. We propose six opportunities for further research considering three dimensions: theoretical, methodological, and contextual. The proposals of this study for future research provide a foundation for researchers, reinforcing the academic, theoretical, and social contributions. Our research has limitations inherent to systematic reviews, with possible variations in search results from other databases, different filtering processes adopted, and the inclusion of books and gray literature.

Keywords: Consumer behavior, consump tion, food, meat, social norms, sustainability.

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Construyendo una agenda de investigación futura para reducir el consumo de carne: una revisión sobre normas sociales, alimentos y bebidas

Resumen: estudios científicos han señalado la necesidad de dietas sostenibles que reduzcan o excluyan el consumo de carne como una medida para abordar la crisis climática. Sin embargo, los nuevos patrones dietarios requieren cambios desafiantes en el comportamiento del consumidor, donde las normas sociales pueden ser una herramienta clave. Este trabajo tiene como objetivo proporcionar una agenda de investigación futura sobre el consumo de carne y las normas sociales, basándose en una revisión de la investigación empírica cuantitativa relacionada con las normas sociales y el comportamiento de consumo de alimentos y bebidas. Los autores buscan llenar un vacío en la literatura al relacionar una teoría consolidada y ampliamente utilizada en intervenciones conductuales con un tema de actualidad académica y social. A partir de una revisión sistemática de artículos avalados por pares, se identificaron patrones interpretables, incluyendo teorías, metodologías, enfoques geográficos, años de publicación, muestras y variables demográficas. Nuestros resultados destacan algunas investigaciones realizadas en Estados Unidos, utilizando la teoría del enfoque normativo como un marco teórico, e involucrando a estudiantes de pregrado en el análisis de los estudios identificados. En consecuencia, proponemos seis oportunidades de investigación en el marco de tres dimensiones: teórica, metodológica y contextual. Las propuestas de este estudio para futuros trabajos proporcionan una base para los investigadores, reforzando las contribuciones académicas, teóricas y sociales. Nuestro trabajo presenta algunas limitaciones inherentes a las revisiones sistemáticas, como posibles variaciones en los resultados de búsqueda en bases de datos, diferentes procesos de filtrado de fuentes y la inclusión de libros y literatura gris.

Palabras clave: comportamiento del consumidor, consumo, alimentos, carne, normas sociales, sostenibilidad.

Construindo uma agenda de pesquisa futura para reduzir o consumo de carne: revisão sobre normas sociais, alimentos e bebidas

Resumo: Estudos científicos têm indicado a necessidade de dietas sustentáveis que reduzam ou excluam o consumo de carne para enfrentar a crise climática. No entanto, novos padrões alimentares exigem mudanças desafiadoras no comportamento do consumidor, e as normas sociais podem ser um meio para alcançar isso. Este estudo visa fornecer uma agenda de pesquisa futura sobre consumo de carne e normas sociais com base em uma visão geral da pesquisa empírica quantitativa relacionada às normas sociais e ao comportamento de consumo de alimentos e bebidas. Buscamos preencher uma lacuna na literatura ao relacionar uma teoria consolidada e amplamente utilizada em intervenções comportamentais a um tópico de atenção acadêmica e social atual. A partir da revisão sistemática de artigos revisados por pares, identificamos padrões interpretáveis, incluindo teorias, metodologias, foco geográfico, ano de publicação, amostras e variáveis demográficas. Nossos resultados destacaram pesquisas realizadas nos Estados Unidos, utilizando a teoria do foco da conduta normativa como lente teórica e envolvendo estudantes de graduação. Propomos seis oportunidades para pesquisas futuras considerando três dimensões: teórica, metodológica e contextual. As propostas deste estudo para pesquisas futuras fornecem uma base para os pesquisadores, reforçando as contribuições acadêmicas, teóricas e sociais. Nossa pesquisa apresenta limitações inerentes às revisões sistemáticas, com possíveis variações nos resultados de busca de outras bases de dados, diferentes processos de filtragem adotados e a inclusão de livros e literatura cinzenta.

Palavras-chave: comportamento do consumidor, consumo, alimentos, carnes, normas sociais, sustentabilidade.

Introduction

The social challenges of health, climate change, and biodiversity loss demand a global transformation to a fair, healthy, and environmentally friendly food system. Among foods, meat has received special attention due to the overall impact of its supply chain, from production to consumption (Clune *et al.*, 2017; Ivanova *et al.*, 2020). A body of studies suggests that more sustainable diets are necessary and consistently recommends reducing meat and animal product consumption and replacing them with plant-based or other protein alternatives (Creutzig et al., 2018; Springmann et al., 2018; The Lancet, 2018).

However, changes in eating patterns are challenging due to the complexity of eating behavior (Vermeir *et al.*, 2020). Multiple factors influence meat consumption, which can be classified into personal, socio-cultural, and external factors (Stoll-Kleemann & Schmidt, 2017). Meat consumption serves as a means to express self-identity and social identities, social representations, culture, religion, and power (De Backer *et al.*, 2020; Leroy & Praet, 2015; Rosenfeld *et al.*, 2020; Timeo & Suitner, 2018).

Meat is central to Western diets, and its consumption is socially accepted and even encouraged (Bohm *et al.*, 2015). The nutritional qualities of meat also secure its place in national dietary guidelines and tie it to food security (Ministry of Health, 2014; NHMRC, 2013; Vale *et al.*, 2019), although its excessive consumption is linked to chronic diseases (Leroy, 2019). Furthermore, there are environmental problems associated with meat production, such as greenhouse gas emissions, land, water, and energy use, and deforestation (The Lancet, 2018).

Given this backdrop, reducing meat consumption is among the main initiatives for climate change mitigation (Ivanova *et al.*, 2020). Scientific literature reports a growing consumer willingness to change protein consumption (Bryant, 2019; Cheah *et al.*, 2020). Despite this, when it comes to meat consumption, intentions have not been reflected in behavioral changes (Hielkema & Lund, 2021). Regarding the market, meat sales and consumption rates have increased in the last decades, and forecasts indicate growth in the coming years (Sahlin *et al.*, 2020).

The challenges of sustainability's social, economic, and environmental dimensions arising from the current high levels of meat consumption are compounded by resistance and barriers to reducing consumption. From the consumer perspective, the final link in the value chain, it is necessary to search for alternatives and tools to enable consumers to align their intentions with their behavior. Considering that food consumption decisions involve a multifaceted context, including the socio-cultural environment, interventions to reduce meat consumption based on social norms emerge as an alternative that should be investigated, given the well-recognized influence of social norms on behavior (Eker *et al.*, 2019; Higgs & Thomas, 2016; Mollen *et al.*, 2013).

Social norms are negotiated rules and patterns to regulate social behaviors communicated and understood by members of a specific group (Cialdini *et al.*, 1990). Although these norms guide or restrict behaviors and conduct, they are not supported by a formal law system (Cialdini & Trost, 1998). Therefore, the more relevant the membership to the self-concept, the stronger the group identification, the adherence to group social norms (Hirsh & Kang, 2016), and, consequently, the engagement with norm-related behaviors (Lapinski & Rimal, 2005).

Two types of social norms emerge from the socio-cultural context. Descriptive norms are standard social behaviors that follow what other group members do and are learned by observation and imitation (Cialdini *et al.*, 1990; Miller & Prentice, 2016). They dictate what behavior is considered "normal" (Thøgersen, 2006) and guide behavioral choices in new or unclear situations. Injunctive norms—also called prescriptive norms (Hawkins *et al.*, 2019)—are related to socially valued behaviors resulting from approval or disapproval by peers. They determine what should and should not be done, with the main motivational component being the sanction or the feeling of moral sanction.

Social norms are prominently in several influential behavior theories (Higgs, 2015; Lee *et al.*, 2007; Neighbors *et al.*, 2011; Robinson, 2015). Behavioral change interventions using social norms have been applied through quantitative approaches in several studies, including environmental behaviors (Goldstein *et al.*, 2008; Lapinski *et al.*, 2017), intergroup behaviors, such as discrimination and fairness (Amiot *et al.*, 2018), substance abuse (Lac & Donaldson, 2018), sugar-

sweetened beverages consumption (Rosas *et al.*, 2017), alcohol use (Real & Rimal, 2007), and food consumption (Hawkins *et al.*, 2020). However, there is a lack of studies on meat consumption and social norms (Kwasny *et al.*, 2021), which represents a gap that opens avenues to further studies using social norms to reduce meat consumption.

This study aims to identify the characteristics of quantitative research on the effect of social norms on food and beverage consumption behaviors, providing directions for future research on meat consumption and social norms. Through a systematic review, we identified and described the quantitative empirical research conducted to date related to social norms and food and drink consumption. As a result, we highlighted research opportunities associated with theoretical, methodological, and contextual dimensions, proposing seven topics for future studies on meat consumption behavior.

The topic is relevant for both marketing and the fields of food consumption and sustainability. Existing consumer behavior theories do not seem to address contemporary problems related to sustainable consumption behavior, which motivated us to explore intersections between theory and issues relevant to society, aiming to develop the social norms theory and the field of food and meat consumption. The social contribution lies in articulating valuable information for future research to reduce meat consumption and promote sustainable diets. Ongoing climate change mitigation is urgent and requires efforts across all areas, including academia. Our research is also connected with the UN Sustainable Development Goals (SDGs), particularly Goal 12, targeting 12.3, 12.8, and 12A.

This article is organized as follows: presentation and justification of the research method, results, discussion, opportunities for further research on meat consumption reduction, and conclusions of the research study.

Method

The systematic review is a strategy for summarizing existing knowledge by exploring primary empirical sources (Paré *et al.*, 2015). To ensure the transparency and replicability of results, we followed a predefined structured protocol based on previous reviews (Bossle *et al.*, 2016; Canto *et al.*, 2021; Gilal *et al.*, 2019; Rosado-Serrano *et al.*, 2018; Stangherlin & Barcellos, 2018). Figure 1 demonstrates the systematic review process. Additionally, to ensure data robustness and quality, our research strategy was based in the typology of analyses proposed by Paré *et al.* (2015) to systematic analysis, defining i) the overarching research goal, ii) the scope of question, iii) the search strategy or coverage, iv) the nature of primary sources resources, v) the explicity study selection, vi) the quality appraisal, and vii) methods for synthesizing and analyzing findings.

First, we defined the research question: What are the characteristics of quantitative research on the effect of social norms on food and drink consumption behaviors? We began with an exploratory search, collecting papers from Google Scholar, ISI Web of Science, and Scopus databases to explore the theme. Based on this initial search, we refined the inclusion and exclusion criteria, selection of databases, types of publications, and the keywords to be used in the search.

The final search comprised papers from the ISI Web of Science (WoS) and Scopus database, and was not restricted by date. Scopus was selected for being the largest database of abstracts and citations reviewed by peers and its emphasis on social sciences (Bossle *et al.*, 2016; Homrich *et al.*, 2018). The Web of Science is widely accepted and frequently used to analyze scientific publications (González-Serrano *et al.*, 2020; Morioka & de Carvalho, 2016).

The keywords were chosen to encompass theory (social norms), method (empirical quantitative), and domain (food and drink). Hence, we have used the terms *social norms, social norm, descriptive norm, injunctive norm, eating norm, group norm, mediator, moderator, variable, experiment, survey, quantitative, empirical, food, meat, beef, drink, beverage, consumption, consumer*.

These terms were applied using Boolean operators OR and AND as a "topic" in WoS (encompassing title, abstract, and keywords). The same search string was applied in Scopus for "article title, abstract and keyword". We selected a broad range of knowledge areas with a consolidated body of research on social norms and behavior to adopt a multidisciplinary approach. We assumed that this diversity of areas would expand theoretical and knowledge perspectives. Given the interdisciplinary nature of the concept and manifestation of social norms, this diversity contributes to a variety of theories and approaches, thereby facilitating the development of the theory (Legros & Cislaghi, 2020).

The final categories defined were: i) in WoS: Substance Abuse, Sociology, Anthropology, Nutrition Dietetics, Psychology Applied, Psychology, Environmental Science, Ethics, Psychology Multidisciplinary, Business, Environmental Studies, Food Science Technology, Social Sciences Interdisciplinary, Green Sustainable Science Technology, Management, Communication, Behavioral Sciences, Economics, Ecology, Social Issues, Multidisciplinary Sciences, Psychology Social; ii) in Scopus: Medicine, Nursing, Psychology, Social Sciences, Pharmacology, Toxicology, and Pharmaceutics; Business, Management, and Accounting; Environmental Science; Economics, Econometrics, and Finance.

Our search yielded a total of 521 papers (WoS, $n = 269$; Scopus, $n = 252$), and 98 duplicates were excluded. We have limited the review to journals that met one of the following criteria: being included in the Association of Business Schools (ABS) list or with a Scopus Cite score of 2 and above or Social Science Citation Index score of 1 and above (Rosado-Serrano *et al.*, 2018). The application of source criteria resulted in the exclusion of 88 papers.
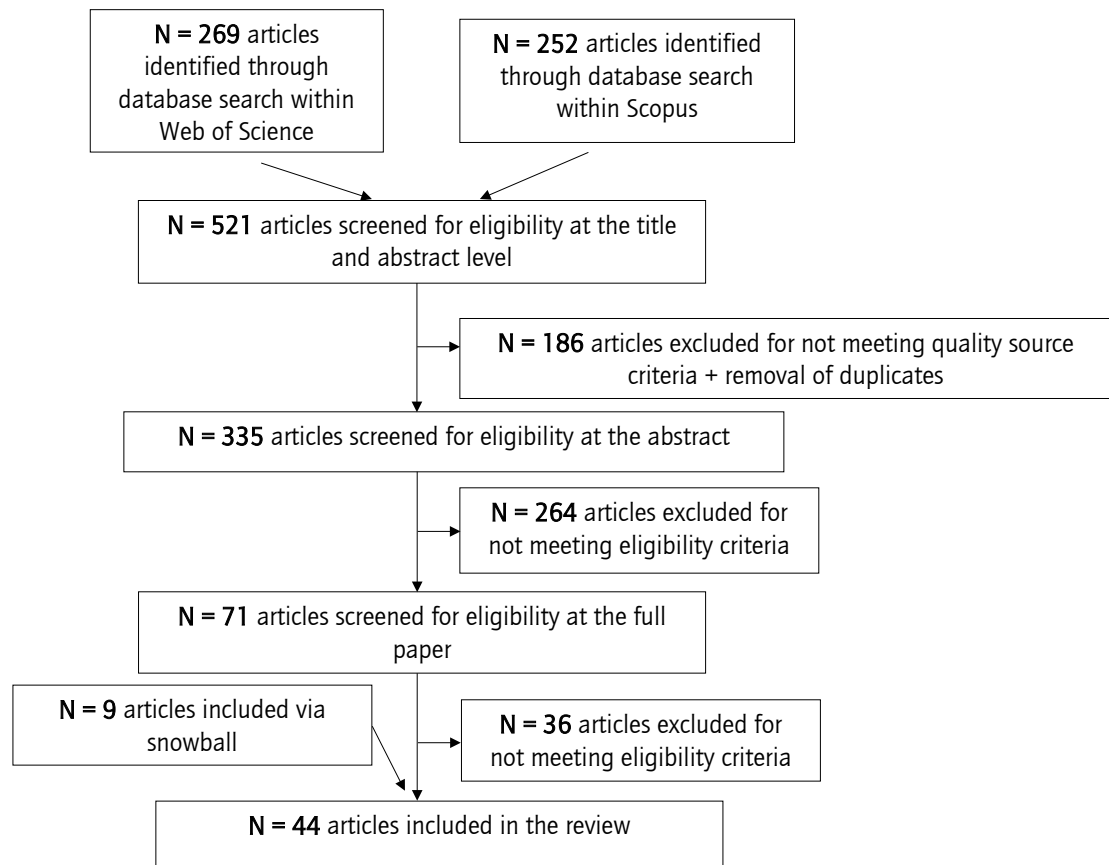
Figure 1. Systematic review process.

Source: authors.

The inclusion criteria were papers i) peer-reviewed; ii) available in English; iii) related to consumer behavior; iv) that investigated social norms' influences on food and/or drink consumption; v) that empirically investigated the effect on consumer behavior or intent; vi) with quantitative method research; and vii) studying social norm as an independent variable. We excluded literature reviews and papers focusing exclusively on children's behavior due to the specific developmental characteristics of this life phase, as well as studies addressing conditions that could influence food or drink intake, such as pregnancy. Additionally, we excluded papers that tested social norms as a moderator or mediator construct. We chose to include alcohol consumption within the scope of the review, given the substantial body of research in this area.

We screened the abstracts of 335 remaining papers to assess their relevance and determine which met the inclusion criteria. Full papers were consulted when the abstract alone did not provide sufficient information to apply the criteria. Out of these, 264 papers were excluded, resulting in 71 articles being fully reviewed. After this thorough reading, 36 were excluded. Ultimately, 35 full

papers were retained. We then employed a snowball method to identify additional references, including 9 papers that met all the protocol criteria. Thus, our final sample consisted of 44 papers (table 1).

Table 1. Articles included in this review.

Journal	No. of Articles	References
Addictive Behaviors	7	Cail and LaBrie (2010); Dumas *et al.* (2019); LaBrie *et al.* (2012); Lac and Donaldson (2018); Maddock and Glanz (2005); Oostveen *et al.* (1996); Tahaney and Palfai (2018)
Appetite	6	Hawkins *et al.* (2020); Howland *et al.* (2012); Lally *et al.* (2011); Mollen *et al.* (2013); Nix and Wengreen (2017); Wengreen *et al.* (2017)
Health Communication	6	Brannon (2020); Real and Rimal (2007); Rimal (2008); Smith *et al.* (2020); Thompson *et al.* (2020); Yang and Nan (2019); Yun and Silk (2011)
Psychology of Addictive Behaviors	3	Litt *et al.* (2012); Neighbors *et al.* (2010, 2011)
Communication Research	2	Lapinski *et al.* (2017); Rimal and Real (2005)
Health Psychology	2	Baker *et al.* (2003); Rice and Klein (2019)
Journal of Studies on Alcohol and Drugs	2	Jackson *et al.* (2014); Lee *et al.* (2007)
American Journal of Health Behavior	1	Pelletier *et al.* (2014)
Basic and Applied Social Psychology	1	Rosas *et al.* (2017)
British Food Journal	1	Golob *et al.* (2018)
British Journal of Health Psychology	1	Stok *et al.* (2014)
Communication Theory	1	Rimal and Real (2003)
European Journal of Marketing	1	Olsen and Grunert (2010)
International Journal of Behavioral Nutrition and Physical Activity	1	Bevelander *et al.* (2020)
Journal of Applied Social Psychology	2	Staunton *et al.* (2014)
Journal of Experimental Social Psychology	1	Liu *et al.* (2019)
Journal of Health Communication	1	Padon *et al.* (2016)
Journal of the American College Health Association	1	Licciardone (2003)
Organization and Environment	1	Salmivaara and Lankoski (2019)

Journal	No. of Articles	References
Preventive Medicine	1	Croker *et al.* (2009)
Psychological Science	1	Sparkman and Walton (2017)
Sustainability	1	Wenzig and Gruchmann (2018)
Technological Forecasting and Social Change	1	Hynes and Wilson (2016)
Total number of journal articles		44 from 23 journals

Source: authors.

The analysis of the papers was guided by categories previously defined based on theory and prior reviews, and aligned with the main objective of the review. One category emerged from the data (Focus). We classified these categories into dimensions that inform the development of the future research agenda. Table 2 details the dimensions, definitions, and foundations of each category of analysis. The data were organized and analyzed using Microsoft Excel 2019 (version 16.70) for organizing descriptive data and calculating data frequency, and Atlas.ti 9 for data grouping.

Table 2. Categories of analysis.

Dimension	Category of analysis	Definition	Basis
Contextual	Geographical scope of analysis	Country and continent where data was collected	Previous reviews (Bossle *et al.*, 2016; Canto *et al.*, 2021; Gilal *et al.*, 2019; Rosado-Serrano *et al.*, 2018; Stangherlin & Barcellos, 2018)
	Years of publication	Year of publication of the research	Previous reviews (Bossle *et al.*, 2016; Canto *et al.*, 2021; Gilal *et al.*, 2019; Rosado-Serrano *et al.*, 2018; Stangherlin & Barcellos, 2018)
	Type of consumption behavior	Which consumption behaviors were focused on by the surveys consumption behaviors	Emerged from the data
	Type of food and beverage	Which foods and beverages were the object of the research, as well as the associated consumption behaviors	Research main goal
Theoretical	Social norms-related theories	Theories used as the basis or theoretical lens of the research or the proposed theoretical model	Research main goal

Dimension	Category of analysis	Definition	Basis
	Norms	Whether the research detailed the type of norms (for example, whether descriptive, injunctive). If so, what typology of social norms was used in the research	Differences between the type of norms identified by the Focus Theory of Normative Conduct (Cialdini *et al.*, 1990) and between these effects on food consumption behavior (Robinson, 2015; Sharps & Robinson, 2016)
	Reference groups	If the research explained the reference groups used in the instrument. If so, what were the groups	The importance of the reference group and identification of normative effect (Cialdini *et al.*, 1990; Graça *et al.*, 2015)
Methodological	Research methods	Quantitative research methods used	Research main goal
	Data collection strategy	Which procedure was used for data collection	
	Samples	Characteristics of the samples used	
	Control variables	Variables used to control the external influence on the relationship between the dependent and independent variables surveyed	
	Agendas to future research on the social norm	Opportunities for future research identified by the authors based on the results and limitations of their work	

Source: authors.

Results

The reviewed articles allowed the identification of general information from the research, the context of the study and related to the studied theory, which is presented below.

Contextual dimension

Geographical scope of analysis: The researches were carried out predominantly in North America (68%). The other continents were Europe (30%) and Oceania (2%). The United States, The Netherlands, and the United Kingdom are the countries with the largest number of studies. None of the studies included in the review were conducted with Latin American or Asian samples (table 3).

Table 3. Countries where research studies were carried out.

Continent	Country	Quantity
Oceania	Australia	1
Europe	Finland	1
	Germany	1
	Norway	1
	Slovenia	3
	The Nederlands	5
	United Kingdom	1
North America	United States	30
	Canada	1
Total: 44 research in 9 different countries from 3 continents		

Source: authors.

Years of publication: The papers reviewed were published between 1996 and 2020. 70% of our sample were papers published in the last ten years ($n = 31$), with an increase in publications in the last five years: 45% were published from 2016 to 2020 ($n = 20$), as shown in figure 2.
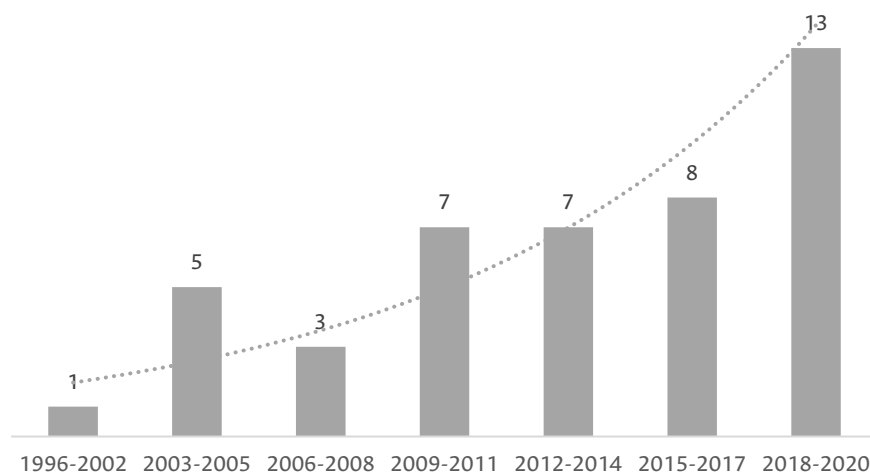

Figure 2. Distribution of the papers included in the systematic review per 3-year interval.

Source: authors.

Type of consumption behavior: We identified the type of behavior researched in the studies and classified them into four categories: eating behavior (n = 7), sustainable behavior (n = 6), health-related behavior (n = 11), and drinking behavior (n = 20). Studies on sustainable behavior

focused on the consumption of ethical, locally produced, and environmentally friendly foods. Some studies examined eating behavior in conjunction with other behaviors, such as physical activity (Rice & Klein, 2019) or sustainable practices like water conservation (Sparkman & Walton, 2017). Figure 3 illustrates the distribution of studies within the analyzed sample.
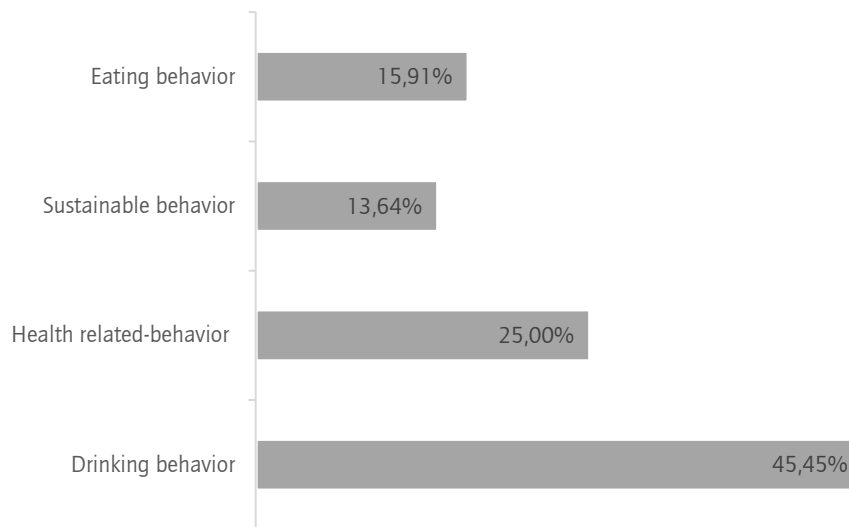

Figure 3. Types of consumption behavior.

Source: authors.

Type food and beverage: The analyzed papers investigated a range of ten different food and drink types (table 4). Alcohol ($n = 21$) and fruit and/or vegetables ($n = 9$) were the most frequently used types of products in research. The meat was studied in one research (Sparkman & Walton, 2017).

Table 4. Type of food and beverage.

Type	Frequency (#)	Frequency (%)
Alcohol	21	43,75
Fruit and vegetable	9	18,75
General	4	8,33
Sugar-sweetened beverages	4	8,33
Fast food; junk food	3	6,25
Snacks	3	6,25

Type	Frequency (#)	Frequency (%)
Appetizing foods	1	2,08
Fish	1	2,08
Meat	1	2,08
Roach fish patties	1	2,08

Source: authors.

Theoretical dimension

Social norms-related theories. We were able to identify the theoretical perspective in 20 papers. Table 5 systematizes the theories related to social norms that supported the investigations.

Table 5. Theoretical perspective related to social norms that supported the investigations.

Theory	Summary	Paper
Focus theory of normative conduct (Cialdini *et al.*, 1991)	Social norms are negotiated rules and patterns to regulate social behaviors communicated and understood by members of a specific group. There are two types of social norms: descriptive and injunctive.	Hawkins *et al.* (2020); Jackson *et al.* (2014); Rosas *et al.*(2017); Salmivaara and Lankoski (2019); Smith *et al.* (2020); Sparkman and Walton (2017); Yang and Nan (2019)
Theory of normative social behavior (TNSB) (Rimal & Real, 2005)	There are two types of norms: descriptive and injunctive. Descriptive norms refer to individuals' perceptions of the prevalence of certain behaviors and influence their own behavior. Three normative mechanisms moderate the effect of descriptive norms on behavior: injunctive norms, outcome expectations, and group identity.	Lapinski *et al.* (2017); Padon *et al.* (2016); Real and Rimal (2007); Rimal (2008); Rimal and Real (2005); Yun and Silk (2011)
Social norm approach/theory (Perkins & Berkowitz, 1986; Berkowitz, 2004)	There is a misperception between perceived norms (what we think our peers believe) and actual norms (what they believe and how they act). Interventions on social norms should correct this misperception.	Lac and Donaldson (2018; Smith *et al.* (2020)
Theory of planned behavior (TBP) (Ajzen, 1991)	Attitudes, subjective norms, and perceived behavioral control predict an individual's intention to engage in a specific behavior, which is the most proximal determinant of actual behavior.	Baker *et al.* (2003); Hynes and Wilson (2016); Staunton *et al.* (2014)
Extended norm taxonomy (Thøgersen, 2006)	Norms are assumed to form a continuum of increasing levels of internalization and integration into the self, from individual internal to external levels. Descriptive norms are more external, while injunctive norms are more internal and encompass subjective and personal norms (introjected and integrated).	Wenzig and Gruchmann (2018); Hynes and Wilson (2016)

Source: authors.

Type of norms: The papers exploring descriptive and injunctive norms (n = 20), just descriptive (n = 13) or injunctive (n = 4) norms, or did not make a distinction between the type of norms, just calling "social norms" (n = 7). One paper address dynamic norms (Sparkman & Walton, 2017).

Reference groups: The reference groups were predefined based on the type of sample and study objective. We could identify the group used to make salient the group identification, analyzing the norm manipulation procedure. We aggregated the findings into categories, as shown in table 6.

Table 6. Reference groups identified in the review.

Category	Examples
Other students	Students from the same university or school; classmates
Family	Just parents; parents, brothers and sisters
Geographic proximity	People living in the same country or neighborhood
General	"Peers"; "people of the same age"; "significant others"; "people that are important to me"

Source: authors.

Methodological dimension

Research methods: Our sample presents a predominance of surveys (n = 29), using both cross-sectional (n = 24) and longitudinal strategies (n = 5). Experiments were also frequent in our sample (n = 11), carried out in the laboratory (n = 7), field (n = 3), and laboratory and field (n = 1). Other methods were secondary data analysis (n = 2) and a multimethod research design (n = 2).

Data collection strategy: The data collection for the papers was primarily based on self-report instruments using scales from previous studies. To encourage participation, incentives were offered in more than half of the studies (n = 25). Examples of incentives include gift cards, monetary compensation, small rewards (e.g., snacks), and course credits. Panels provided by established research agencies, such as Amazon Mechanical Turk (MTurk) and GfK Custom Research's KnowledgePanel, were used for participant recruitment (Golob *et al.*, 2018; Padon *et al.*, 2016; Sparkman & Walton, 2017).

Samples: The samples included participants aged between 13 and 77 years, with the majority being undergraduate students. Sample sizes varied across studies: 2 studies used samples of fewer than 100 respondents; 26 studies employed samples ranging from 101 to 500 respondents; 8 studies had samples of 501 to 1,000 respondents; and 14 studies reported samples

larger than 1,000 respondents. The total number exceeds 44 studies because some papers reported more than one study and, consequently, more than one sample (figure 4).
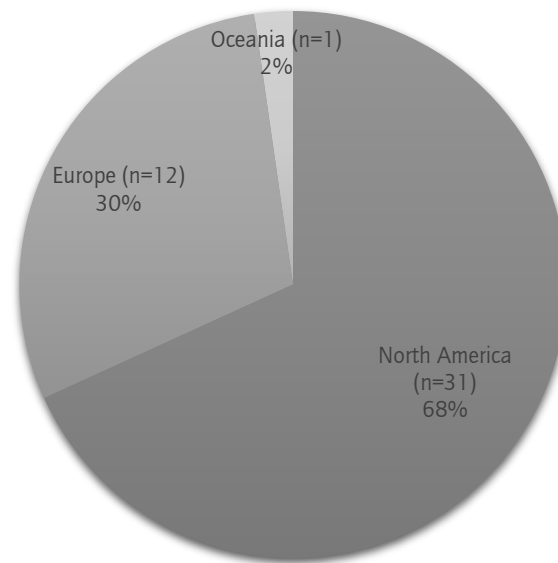

Figure 4. Type of sample.

*Undergraduate students (n = 28); General (n = 7); Youth (n = 7), Other (n = 2). Youths are adolescents and people between 13 and 29 years old; General is people between 16 and 65 years old; Others encompass studies that used a sample of adolescents and their parents or just parents.
Source: authors.

Control variables. A multiplicity of control variables were found. The most frequently used, in different study contexts, were sex/gender ($n = 37$), age ($n = 30$), and ethnicity (race/white or non-white; $n = 20$). It was observed that some control variables are associated with the type of food or drink studied. For example, studies examining the effect of social norms on food consumption controlled for variables such as height and weight, body mass index, minutes of exercise per week, and meat consumption patterns (vegetarian versus non-vegetarian). In the context of alcohol consumption, variables such as social status, academic standing, prior alcohol use, age at first drink, parental drinking habits, living arrangements (on or off campus), and gender are considered predictors of alcohol consumption.

Discussion

The reviewed literature revealed a predominance of studies conducted in North America, particularly the United States, and Europe, highlighting a lack of research in countries with diverse

contexts. This finding is aligned with Shulman *et al.* (2017), who reviewed social norm research in the social sciences and found that studies based in the United States were the most common (> 50% of the papers), followed by those in the United Kingdom and the Netherlands. Our results demonstrate a similar pattern.

The studied societies can be classified as WEIRD (Western, educated, industrialized, rich, and democratic), according to Henrich *et al.* (2010). The authors argue that members of these societies are not representative of other populations, leading to research that is more focused on the behavior of these specific societies rather than on human behavior in general. As a result, the findings have limited generalizability (Brauer *et al.*, 2021). Regarding social norms, the geographical distribution of samples in the analyzed papers reflects the same pattern observed in other areas of human behavior research.

We observed an increase in publications related to food consumption over the last five years. Initially focused on interventions related to alcohol consumption, the study of the effect of social norms on dietary intentions and eating behavior appears to be gaining traction in response to social and environmental demands for dietary changes. From a social perspective, rising obesity rates globally represent a significant public health issue (World Obesity Federation, 2023). Diet-related problems such as obesity, diabetes, and other chronic diseases have increased worldwide over the past decades (FAO *et al.*, 2020). Additionally, the double burden of malnutrition—the coexistence of both undernutrition and overnutrition—is a growing challenge in Latin American countries.

In terms of environmental impact, the global food system—including activities and outcomes related to both consumption and production—accounts for 30% of energy consumption and 22% of greenhouse gas emissions (Willits-Smith *et al.*, 2020). Sustainable diets promote food production chains that minimize greenhouse gas emissions, reduce freshwater use, mitigate biodiversity loss, and prevent land-system changes while preserving nitrogen and phosphorus cycles (Willett *et al.*, 2019). Among the analyzed papers related to food, studies focused on health-related and sustainable behaviors were prevalent in our sample, reinforcing this perception.

The results support the cross-disciplinary approach to social norms research proposed by Legros and Cislaghi (2020). Our findings reveal investigations published across various fields, including Psychology, Marketing, Health/Medicine, Communication, and Sustainability/Environment. Consequently, this diversity leads to the application of multiple theories and approaches, which can sometimes be conflicting (Legros & Cislaghi, 2020). In fact, we identified a range of theories applied to social norms studies. The Focus Theory of Normative Conduct (Cialdini *et al.*, 1990) was the most cited and frequently used in the literature reviewed, applied to a broad range of behaviors. This theory posits that social norms are a set of norms shared by group members, with their strength depending on the normative focus, or their salience. The

theory also distinguishes between two types of norms: injunctive and descriptive (Cialdini *et al.*, 1990).

All the identified theories share a common distinction between descriptive and injunctive norms. Several authors argue that this conceptual differentiation is essential, as each type of norm is a distinct construct with a different impact on behavior (Lee *et al.*, 2007; Rimal & Real, 2003; Staunton *et al.*, 2014). For example, the TNSB considers descriptive norm as the independent variable and injunctive norm as moderating variable (Rimal & Real, 2003, 2005).

Our results indicate that surveys using self-report instruments with scales from previous studies are the most common methodological strategy in the analyzed research, with a frequent reliance on undergraduate student samples. This cohort tends to consume more alcohol than other groups and is particularly vulnerable to drinking behaviors (Rimal, 2008), which helps explain this finding. Furthermore, young adulthood is a critical developmental period during which many health behaviors are established (Pelletier *et al.*, 2014), and alcohol use is a major risk factor for loss of productivity among individuals aged 15–29 (WHO, 2019).

On the other hand, the predominance of studies involving undergraduate students raises concerns about the representativeness of WEIRD samples (Henrich *et al.*, 2010). As previously discussed, this lack of representativeness becomes more pronounced when considering the geographic scope of the surveys. Additionally, the results regarding the methodological dimension revealed that surveys using self-report instruments are the primary data collection method. Limitations associated with self-reported behaviors include discrepancies between reported and actual behaviors (Wenzig & Gruchmann, 2018), which highlights opportunities for future research, as we will discuss in the following section.

Opportunities to further research on reduction meat consumption

We have identified several areas for further research. These insights pertain to underexplored topics and have the potential to contribute to Social Norms Theory, methodological advancements, and the context of meat consumption.

Theoretical insights

Explore norm misperception. The misperception of the norm is a phenomenon explored in alcohol consumption studies and is still poorly investigated in the food domain. It refers to the overestimation of the peer drink norms and is the base of the Social Norm Theory (Perkins & Berkowitz, 1986). According to Dumas *et al.* (2019), previous research studies have consistently found the misperception of the drinking norm by university students, which is associated with

heightened alcohol consumption, heavy drinking, and related negative consequences. Other people's behavior is often magnified, and social norms are perceived with bias, influencing individual behavior. Studies in both the alcohol and dietary domains have found evidence of social norm misperceptions (Lally *et al.*, 2011). However, our review identified few studies exploring this theoretical phenomenon in the context of food. Interventions aimed at correcting these misperceptions have been shown to reduce alcohol consumption (Padon *et al.*, 2016), suggesting potential for further research into similar interventions for reducing meat and other foods where decreased consumption is warranted.

The complexity of social environment: disparity, misalignment or conflict of social norms. Social norms may not always be congruent with each other. In multidimensional choices—as sustainable food, involving at the same time eating and sustainable-related factors—injunctive or descriptive norms within one in-group can be even opposed (Salmivaara & Lankoski, 2019). Another situation is the disparity or conflict of social norms from different groups that the person identified, as investigated by Cail and LaBrie (2010). Their findings indicated a significant association between discrepancies in norms between peers and family, individual consumption, and negative consequences related to alcohol. The impact of simultaneously activating misaligned norms, whether within a group or between groups, on meat consumption behavior has not yet been studied and may uncover new insights and opportunities for intervention.

Methodological insights

Diversification of samples. Despite the relevance of investigation and intervention on students and youths, examining other cohorts can be important in the food domain. Considering the global trend of population aging and the lesser effect of social norms on the behavior of older people (Eker *et al.*, 2019), studies focusing on adults and the elderly can collaborate with the advancement of the theory and the development of behavioral interventions with a more comprehensive effect. Among the control variables identified, predictors of behavior in previous studies, such as sorority/fraternity affiliation, place of residence (living on or off campus), and educational level, are directly related to the sample type. Gender, age, ethnicity, and socioeconomic status also serve as predictors, highlighting the importance of diversifying sample types in future research.

Attention to the reference group. Due to the predominance of studies with university students, the reference groups used in the interventions are generally peers or other students. Some studies explore the family (mostly parents) as a reference group. Reference group plays a central role in the social norm influence because norm adherence is related to the degree of identification with the group (Goldstein *et al.*, 2008). Considering that the importance of other students and family can decrease in adulthood, diverse reference groups could be explored in future studies.

Questioning the respondents who are their reference group can be a strategy for identifying important groups (and consequently, norms) that influence their behavior.

Another important issue is the group's proximity. We have identified in this review differences between proximal and distal groups' norms affecting consumption intentions and behavior (Jackson *et al.*, 2014; Lac & Donaldson, 2018; Maddock & Glanz, 2005; Yun & Silk, 2011). The results indicated that the closer the group is to the individual, the stronger the effect of the norm. Therefore, we recommend that future studies focus on the reference group used in manipulations, specifically by i) verifying the real relevance of the group to the participant and ii) ensuring proximity.

An interesting point is that the concept of proximity can be extended to groups in digital environments, an area that has not yet been explored in relation to social norms. Social media plays a central role in contemporary life, a role that has been reinforced by restrictions on mobility and social interactions due to the Covid-19 pandemic. This creates opportunities for investigating the influence of social media groups (e.g., Instagram) and online communication tools (e.g., WhatsApp, Telegram) on social norms.

Search for actual behavior. Most of the research reviewed in our work were self-reported surveys. However, it must be considered that there is a gap between self-reported behavior and real behavior (Wenzig & Gruchmann, 2018). Besides, attitude-behavior gaps were observed in purchasing sustainable food products (Vermeir & Verbeke, 2006) and meat intake (Macdiarmid *et al.*, 2016). Therefore, experimental designs are indicated to access actual behavior (Van der Werff *et al.*, 2013).

Experiments conducted in the field or with real behavior are a challenge and sometimes "messiness," exposed to contamination, and lack of control of unforeseen environmental cues (Salmivaara & Lankoski, 2019). However, examining real-life conditions increases the external validity of finding (Mollen *et al.*, 2013) and is recommended to deepen into the understanding of the effects of norms on behavior (Yang & Nan, 2019).

Contextual insights

Understand the "social" by a more amplified geographical scope. We observed a predominance of investigations conducted in developed countries, particularly the United States. This suggests a need to diversify the geographic focus to include a broader range of societies, habits, and cultures. The social environment significantly impacts self-concept (Oyserman, 2009), self-categorization (Abrams & Hogg, 1990), social identity, and group affiliation (Hogg, 2016), all of which influence social norms. Studies conducted in different socio-economic and cultural

contexts may reveal unique aspects and contribute to the enrichment and advancement of social norms theory.

Meat consumption is imbued with symbolism, reflecting group identity and socio-cultural representations (Rosenfeld & Tomiyama, 2019; Roth, 2005). he Food and Agriculture Organization of the United Nations recommends considering culturally acceptable diets alongside environmental, social, economic, and health factors (FAO, 2018). For example, investigating meat consumption behavior in major national markets, such as Brazil—the third largest beef consumer market worldwide (Borges *et al.*, 2020)—is crucial. Therefore, it is essential to account for the social, economic, and cultural aspects of the context in food consumption research.

Table 7 summarizes the opportunities and a proposed set of research questions related to social norms and meat consumption to further investigation prepared by the authors of this paper.

Table 7. Emerging research questions for future research on social norms and meat consumption.

Dimension	Opportunities to research on meat consumption	Research questions to future studies
Theory	Exploring norm misperception	Do people overestimate the meat consumption of relevant others?
	The complexity of social environment: disparity, misalignment or conflict of social norms	Can conflicting social norms reduce meat consumption behavior?
Method	Diversification of samples	Do the influence of social norms meat consumption-related is equal through the different life-stages?
	Attention to the reference group	Which relevant groups exert the greatest influence on decisions regarding the quantity, type, and frequency of meat consumption through social norms?
	Search for actual behavior	Are there differences between self-reported meat consumption behavior and this behavior in real-life conditions?
Context	Understand the "social" by a more amplified geographical scope	Does the social-economic-cultural context influence the effect of social norms on meat consumption behavior?

Source: authors.

Conclusions

This systematic review explored empirical and quantitative research on social norms and consumer behavior within the food and beverage domains. In fulfilling our first objective, our results

highlighted a predominance of investigations conducted in the United States, utilizing the Focus Theory of Normative Conduct as the theoretical framework and focusing primarily on undergraduate students. We observed an increase in publications related to the food domain over the past five years.

Based on the resulting data and information, we offer guidelines for future research on meat consumption and social norms, addressing the purpose of our investigation. The proposed research opportunities encompass relevant dimensions, including the elaboration and contextualization of the studied problem (context), the theoretical foundation, direction, and argumentation (theory), and methodological considerations (method). In conclusion, we observe that the intersection between social norms and the consumption of food and beverages represents a novel and contemporary field of research.

Overall, the primary contribution of this article is academic. Despite the well-recognized influence of social norms on consumer behavior, there is a paucity of studies focusing specifically on social norms and reducing meat consumption. To our knowledge, this effort to identify opportunities for future research applying social norms to meat consumption is unprecedented in the literature. Furthermore, there is a notable opportunity to expand quantitative studies on the impact of social norms on meat consumption.

Our findings should be considered within the context of certain limitations. The databases used, search procedures, filtering processes, and types of literature selected may have excluded some relevant studies. Future research might employ different inclusion and exclusion criteria, databases, and filtering strategies to yield alternative results. Additionally, we recommend incorporating empirical studies with qualitative or multi-methodological approaches, given the complexity and emerging nature of this topic.

The applied search strategy sought research in which social norms were the independent variable. We filtered the results, excluded most articles that use the Theory of planned behavior (TPB) and analyzed research on extended theory models. TPB is widely used in studies on consumer behavior and considers injunctive norms as moderating variables (Hassan *et al.*, 2016). Future studies may expand the sample, including works based on the TPB.

Finally, our approach to the theory of social norms is situated within the field of administrative sciences, particularly in marketing and consumer behavior. From this perspective, we conceptualize social norms as a system of shared, implicit rules that guide and influence the behavior of its members (Cialdini *et al.*, 1990; Fritsche *et al.*, 2018; McDonald *et al.*, 2013). Our focus is on the effect of norms on behavior from a cause-effect point of view, not covering the anthropological dynamics and social functioning of norms. Social norms can be seen from the point of view of other fields of knowledge, such as sociology and eating practices (Bourdieu, 2010 {1979}), as well as from the anthropological point of view (Boyd & Richerson, 1994). The limited

understanding within the fields of administrative sciences and marketing when applying Cialdini *et al.* (1990) theory of social norms, while useful in defining the field and its epistemology, inadvertently reduces the perceived complexity of the phenomenon. This narrowing of scope makes the phenomenon more tangible but also more restricted. Future research should address this limitation by conducting a broader literature review that includes theoretical articles and diverse methodological approaches from various scientific disciplines, thereby fostering a more comprehensive understanding of the phenomenon.

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