Food marketing: a systematic literature review analysis for the period 2010-2023

Comercialización de alimentos: un análisis sistemático a través de la revisión de literatura del periodo 2010-2023

Víquez Ramírez, Nicole Valeria [iD]

Universidad de Costa Rica

Solís Rivera, Luis Ricardo [iD]

Universidad de Costa Rica

Solórzano Thompson, Johanna [iD]

Universidad de Costa Rica

Paniagua Molina, Javier [iD]

Universidad de Costa Rica

Abstract

The aim of this article is to carry out a bibliometric literature review of the topic of food marketing (FM) for the period January 2010 to September 2023. A total of 414

Víquez Ramírez, Nicole Valeria, https://orcid.org/0000-0001-6101-3540, Universidad de Costa Rica, nicole.viquez@ucr.ac.cr
Solís Rivera, Luis Ricardo, https://orcid.org/0000-0002-1855-4250, Universidad de Costa Rica, luis.solisrivera@ucr.ac.cr
Solórzano Thompson, Johanna, https://orcid.org/0000-0002-0276-6849, Universidad de Costa Rica, johanna.solorzano@ucr.ac.cr
Paniagua Molina, Javier, https://orcid.org/0000-0003-2815-5437, Universidad de Costa Rica, javier.paniagua@ucr.ac.cr

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articles were identified using the Scopus database, VOS Viewer software and descriptive analysis in Microsoft Excel with fragmentation observed across 198 academic journals. The articles were found to be clusteres around five main areas of interest, and analysed using co-occurrence maps. The main topics related to each cluster were: (1) child nutrition, (2) food consumption in marketing, (3) food preference by gender and life stage, (4) child-targeted food industry, (5) food marketing, (6) food in health and economics, and (7) Europe. The results indicate significant fragmentation among journal publications on food marketing.

Keywords: nutrition, consumption, market, bibliometric analysis, business management

Resumen

Este artículo estudia el tema de la comercialización de los alimentos (CA) mediante una revisión sistemática de literatura bajo un enfoque bibliométrico durante el periodo de enero 2010 a septiembre 2023. Se utilizó la base de datos Scopus y el software VOS Viewer y se complementó con el análisis descriptivo de la información en Microsoft Excel para obtener un total de 414 artículos, dando señales de su fragmentación a partir de su publicación en 198 revistas científicas. Mediante esta metodología se identificaron cinco tópicos principales en relación con los clusters, los cuales fueron analizados a través de mapas de concurrencia. Las temáticas principales relacionadas a cada clúster fueron (1) nutrición infantil, (2) consumo de alimentos en la mercadotecnia, (3) preferencia alimentaria según género y etapa de vida, (4) industria de alimentos dirigida a niños, (5) comercialización de alimentos, (6) alimentación en la salud y economía y (7) Europa. Se evidenció señales de alta fragmentación en la producción de artículos científicos en la temática de comercialización de los alimentos.

Palabras clave: nutrición, consumo, mercado, análisis bibliométrico, gestión empresarial

1. INTRODUCTION

Marketing, also known as marketing, is a social and administrative process involving exchanging goods or services between two parties, managed by companies that adapt their offerings to consumers' needs and preferences (Sánchez-Gutiérrez et al., 2017). It is conceptualized as an essential element in business, constantly changing and evolving. It plays a fundamental role in business strategies due to the deep understanding companies must have of the market to meet the demand for products and services (Gutiérrez et al., 2016). According to Schlesinger Díaz & Hernández (2004), marketing drives research to identify factors that cause market changes and determine customer needs and preferences. However, this process is influenced by multiple factors such as globalization, technology, cultural trends, political changes, and environmental aspects. Companies must identify the effects of these factors on marketing their products to

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meet consumer needs adequately. Álvarez-Indacochea et al. (2020) define various types of marketing based on the company's focus or objective, adapting their strategic plans according to the product or service offered. One type is commercial marketing of goods, which includes food and beverages distributed to sellers for market introduction. Market research is enriched by producing scientific articles, which act as tools to generate and qualify knowledge through information. Bibliometrics, a sub-discipline of scientometrics, provides valuable information on the results of these investigations, evaluating activity and impact in the research area and sources using mathematical and statistical methodologies to analyze scientific communication. In the field of business sciences, recent studies have used bibliometric analysis to investigate various areas such as entrepreneurship (Chandra, 2018; Dzikowski, 2018; Ferreira et al., 2019), marketing and commercialization (Kim and So, 2022; Kim et al., 2019; Nicolas et al., 2020; Saleem et al., 2021), innovation management (Merigó et al., 2016), and business knowledge management (Gaviria-Marin et al., 2019). This article aims to identify research topics around food marketing (FM) through a systematic literature review using computer tools. This contribution enhances the knowledge of improving food business negotiations in modern society.

2. METHODOLOGY

To develop this research, a systematic literature review was applied using a bibliometric approach, covering the period from January 2010 to September 2023. According to Ellegaard and Wallin (2015), this approach identifies a corpus of literature by selecting a thematic area to analyze the breadth, depth, and trends of a specific line of research. Boyack and Klavans (2014) highlight the importance of bibliometric studies in identifying trends in the origin of scientific publications, research patterns in particular topics, high-impact scientific journals, the historical evolution of the research line, and identifying the most relevant authors.

2.1 Database Construction and Processing

The Scopus database generated the results, employing a Boolean search with the keywords "commercialization" and "food." The results were delimited into the following categories: (1) business, management, and accounting; (2) economics, econometrics, and finance; and (3) agriculture and biological sciences. For processing the selected data, 2471 keywords were identified, from which those with at least three occurrences were filtered, resulting in 304 keywords for analysis. Publications from 2010 to 2023 were considered to meet the study's objectives by taking advantage of the available information in the database. It is essential to highlight that all selected publications belonged to indexed scientific journals, excluding other publications such as editorials, book chapters, technical notes, and conference publications. This decision is based on

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the greater availability of scientific articles and the possibility of comparing results among equivalent publications. All methodological steps are illustrated in Figure 1 below.

Figure 1. Diagram of the steps followed during the systematic review of the methodology used in the study (source: own elaboration)
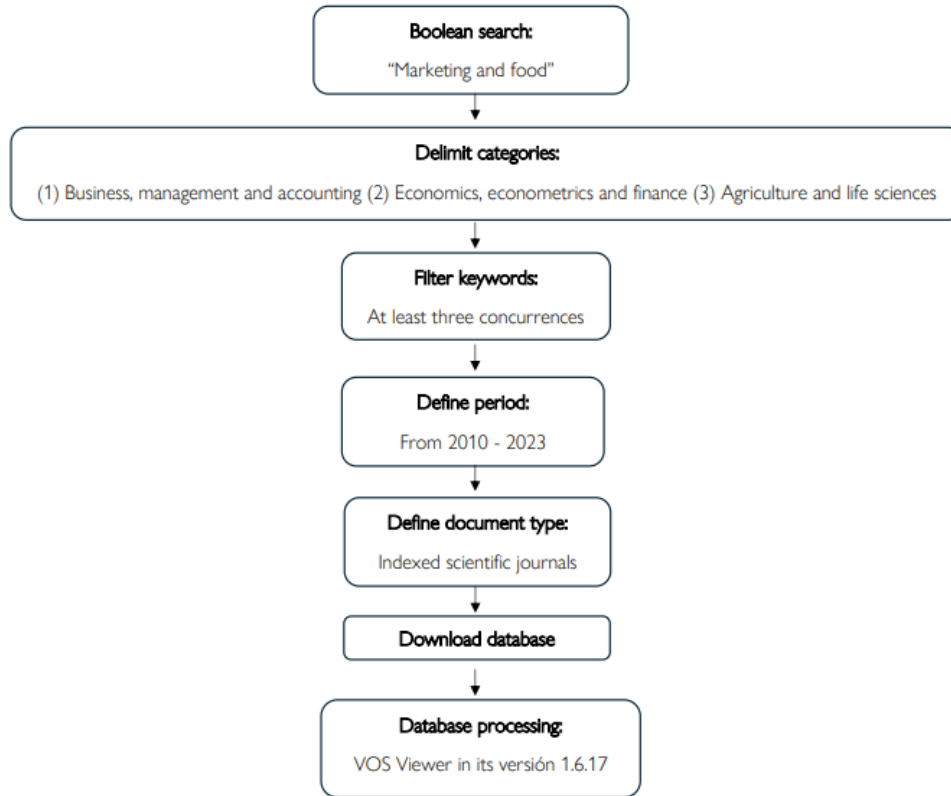
VOS Viewer software version 1.6.17 was used to perform a co-occurrence analysis (meaning the joint appearance of two terms in the same text) by cluster and a co-occurrence map by time series to visualize trends derived from the research line. Additionally, data was processed descriptively, such as the leading scientific journals and the methods used in Excel software. Finally, due to the breadth of the database, the author's characterization of the techniques used was limited to the ten articles with the highest number of citations.

3. RESULTS

3.1 Evolution of scientific production in food marketing

The search identified 414 scientific articles that met the established selection criteria. Scientific production in food marketing remained constant during the evaluation period. As shown in Figure 2, there was a significant increase between 2018 and 2019, from 22 to 42 articles. However, the year with the highest number of publications was 2021, with 54 articles published.

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Figure 2. Number of annual scientific publications in food marketing from 2010-2023 (source: own elaboration)
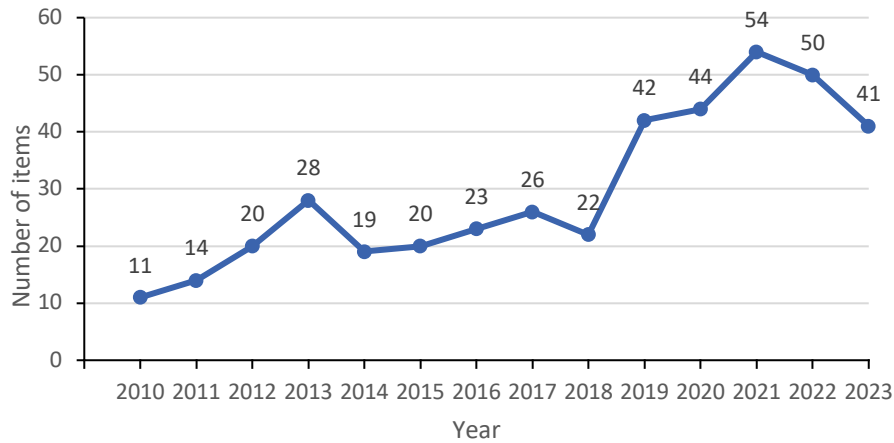
The increase in the number of publications in 2021 may be related to the impact of COVID-19, which emerged in early March 2020. Aleixandre-Benavent et al. (2020) mention the increase in the production of scientific articles since the beginning of the pandemic, with 90%, 79%, and 76% of open access in WoS, Scopus, and Dimensions, respectively. This increase can be considered a significant stage in scientific publications related to the need for food marketing studies and accessibility. The dissemination of reliable information and new knowledge during that period prompted the reorientation of research lines (Párraga Martínez, 2021)

3.2 Origin of scientific production in FM according to affiliations

Four of the 414 articles did not present any affiliation during the established period. Of the remaining 410 publications, ten primary affiliations were identified, each with more than five articles, representing 17.80% of the total. These results are detailed in Table 1.

Table 1. Number of publications and relative Weight by affiliation of articles in food marketing during the period 2010-2023 (Source: own elaboration)

Affiliation	Number of publications	Relative weight
1. University of Calgary	11	2,68%
2. University of Toronto	10	2,44%
3. University of Auckland	9	2,20%
4. Deakin University	8	1,95%
5. University of Ottawa	8	1,95%
6. University of Liverpool	6	1,46%
7. Yale University	6	1,46%
8. University of North Carolina	5	1,22%
9. University of Sydney	5	1,22%
10. University of Wollongong	5	1,22%

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3.3 Most relevant scientific journals in FM

It was identified that 414 articles were published in 198 scientific journals, an average of approximately 2.09 articles per journal. The journals with the most articles comprise around 34% of the total articles selected in the database. Public Health Nutrition has the highest number of publications, representing 6.3% of the total, as shown in Table 2.

Table 2. Relative and absolute frequency of articles related to food marketing in the most relevant journals from 2010-2023 (source: own elaboration)

Journal Name	Number of Publications	Relative Weight (%)	Impact Factor 2022
1. Public Health Nutrition	26	6,3%	5,7
2. Appetite	21	5,1%	8,1
3. International Journal of Environmental Research and Public Health	18	4,3%	5,4
4. Sustainability	18	4,3%	1,7
5. BMC Public Health	12	2,9%	6,1
6. British Food Journal	11	2,7%	5,4
7. Nutrients	11	2,7%	9,0
8. Advance Journal of Food Science and Technology	9	2,2%	0,1
9. Pediatric Obesity	8	1,9%	7,0
10. American Journal of Preventive Medicine	7	1,7%	8,5

Table 3 shows a low concentration of publications in the identified scientific journals, as 143 of the 198 journals only account for one linked article from 2010-2023.

Table 3. Categorization of identified scientific journals by number of publications from 2010-2023 (source: own elaboration)

Scientific production volumen FM	Number of scientific journals	Relative weight
A scientific article	143	72,2%
Two scientific articles	26	13,1%
Three scientific articles	8	4,0%
Four scientific articles	5	2,5%
Five scientific articles	2	1,0%
Six scientific articles	4	2,0%
Seven or more scientific articles	10	5,1%
Total	198	100,0%

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Both identified patterns show high fragmentation in linked article publications and the absence of a primary reference journal in this line of research.

3.4 Key research topics and evolution in FM

An analysis of the total link strength and keywords identified ten main topics related to FM publications during the established period. The three main ones are marketing, children, and food. The ten issues with the greatest strength are detailed in Table 4.

Table 4. Top ten topics in FM by total link strength from 2010-2023 (source: own elaboration)

Topic	Total link strength
Marketing	4516
Children	2869
Food	2552
Female	1984
Food Industry	1925
Male	1850
Beverage	1802
Food Marketing	1696
Advertising	1499
Adolescent	1493

By grouping the topics, seven clusters with significant links between their topics were identified, which can be defined by their central theme according to their keywords: (1) child nutrition, (2) food consumption in marketing, (3) food preference by gender and life stage, (4) food industry aimed at children, (5) food marketing, (6) food in health and economy, and (7) Europe.

The first cluster includes topics about foods' nutritional value, children, and food packaging. Examples of articles referring to these topics include the following articles: "Presence and strategic use of the Mediterranean Diet in food marketing: Analysis and association of nutritional values and advertising claims from 2011 to 2020" (Jiménez y Montaña, 2021); "Children's magazines: reading resources or food marketing tools?" (Jones y Reid, 2010) y "Child-directed and nutrition-focused marketing cues on food packaging: links to nutritional content" (Lapierre et al., 2017).

The second cluster primarily observes marketing, the United States, and public health topics. Articles include "Comparison of nutrient profiling schemes for restricting the marketing of food and drink to children" (Brinsden y Lobstein, 2013), "Mapping the Celebrity Endorsement of Branded Food and Beverage Products and Marketing Campaigns in the United States, 1990–2017" (Zhou et al., 2019), así como

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"Transferability of private food marketing success factors to public food and health policy: An expert Delphi survey" (Aschemann et al., 2012b).

The third cluster presented primarily topics regarding female, male, and adult preferences. The article "Nutrition Marketing on Food Labels" (Colby et al., 2010) covers the first two themes. The article "Perceptions of the food marketing environment among African American teen girls and adults" (Bibeau et al., 2012) addresses the third topic.

The fourth cluster is mainly related to children and the food industry. This is observed in articles like: "Industry self-regulation of food marketing to children: Reading the fine print" (Hebden et al., 2010) y en "Comparison of food industry policies and commitments on marketing to children and product (re)formulation in Australia, New Zealand and Fiji" (Sacks et al., 2015). Additionally, regarding the topic of children, there is a focus on the preschool age, as presented in the article "Infant food marketing strategies undermine effective regulation of breast-milk substitutes: trends in print advertising in Australia,1950-2010" (Smith y Blake, 2013) (Smith & Blake, 2013).

The fifth cluster comprises concepts like food, beverage, and food marketing. These are respectively covered by the article "Online marketing of food products to children: the effects of national consumer policies in high-income countries" (Lascu et al., 2013), "Australian Children's Exposure to, and Engagement With, Web-Based Marketing of Food and Drink Brands: Cross-sectional Observational Study" (Kelly et al., 2021), and Bragg et al. (2013).

The sixth cluster includes health promotion, reflected in the article "How branded marketing and media campaigns can support a healthy diet and food well-being for Americans: Evidence for 13 campaigns in the United States" (Englund et al., 2020). The second topic, based on catering services, is presented in the article "Food marketing expenditures aimed at youth putting the numbers in context" (Powell et al., 2013). Lastly, the topic of the economy is reflected in the article "Marketing messages in food and alcohol magazine advertisements, variations across type and nutritional content of promoted products: a content analysis" (Pitts et al., 2014).

Finally, in the seventh cluster, articles such as "Lessons for public health campaigns from analysing commercial food marketing success factors: a case study" (Aschemann et al., 2012a) and "On Governance, Embedding and Marketing: Reflections on the Construction of Alternative Sustainable Food Networks" (Roep & Wiskerke, 2012) were found.

Considering the total topics and their distribution, the first cluster includes 57 topics, the second 48, the third 47, the fourth 42, the fifth 35, the sixth 21, and the seventh 1. This totals 251 topics. This can be seen in annex 1 in tabular form by cluster and associated link strength, and graphically in Figure 3 with a color scale according to the cluster to which each topic belongs.

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Figure 3. Co-occurrence map by thematic cluster of food marketing (source: own elaboration)

In Figure 4, the themes are shown according to the novelty of the publications during the analyzed period. For 2010, the main topics are children, complementary foods and supplements, brand strategy, drivers, advertising, local food, marketing, consumer price, country brand, and obesity. By 2023, the topics include food marketing, gender, marketing, adolescents, sustainability, COVID-19, ultra-processed foods, childhood obesity, agricultural food supply chains, and climate crises. Generally, considering 2010 and 2023 as the minimum and maximum years in the analyzed period, the areas both share are related to marketing, children, adolescents, obesity, sustainability, and local production.

Figure 4. Co-occurrence map of food marketing themes by publication date (source: own elaboration)

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Analyzing two of the scientific articles containing common topics mentioned in the previous paragraph, the 2010 article titled "Nutritional marketing on food labels" finds that 71% of analyzed products targeted at children had nutritional marketing, and more than 50% contained high levels of saturated fats, sodium, and sugar. One of the findings is that nutritional marketing is often used in foods high in saturated fats, primarily in products aimed at children. Regarding beverages, both products targeted at children and adults contain nutritional marketing and high sugar content (Colby et al., 2010).

Comparing the topics studied in the 2010 scientific article with a 2023 publication titled "The impact of fast food marketing on brand preferences and fast food intake of youth aged 10–17 across six countries", the continued focus on nutrition marketing targeting young people is observed. Among the main results, a positive association is found between fast food consumption in young people and brand preferences and constant consumption, providing results on their respective demand according to the analyzed fast food brands (KFC, Subway and McDonald's). Evidence relates the negative effect of fast-food advertising on young people's preference for these foods by increasing the likelihood of being overweight or obese (Bagnato et al., 2023).

In 2010, the document Marketing strategies in the era of sustainable development: Evidence from the food industry presents the consumer as the primary driver of sustainability marketing strategies, where companies belonging to a premium or quality sector have an active trend in sustainability compared to companies targeting the price segment in the market. One of the fastest-growing segments in Western Europe and North America is associated with products that provide health benefits and their wide availability (Belz & Schmidt-Riediger, 2010).

Finally, for 2023, the article #ThisIsSustainable: The effect of disclosures in influencer marketing for sustainable foods examines that adolescents and young adults are relevant consumers of sustainable products and can recognize commercial messages on social networks. One of its main conclusions highlights that young people develop persuasion knowledge when processing influencer advertising (De Keyzer, 2023). Lastly, the article Research on sustainable agri-food markets: A bibliometric analysis of the field's evolution since 1990 examines the need to improve sustainability according to global, regional, and local approaches (Ruiz-Morales et al., 2023).

4. CONCLUSIONS

Applying a systematic review with a bibliometric approach, high fragmentation was evidenced in producing scientific articles on food marketing from January 2010 to September 2023. This is reflected in that 143 scientific journals, out of 198, published only one article each, representing 72.2% of the total. This information is valuable for food marketing and bibliometrics because it determines the sources of research and knowledge.

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An increase in particle production was observed between 2018 and 2019, reaching its highest value in 2021. This increase is related to the impact generated in the scientific field by the COVID-19 pandemic during 2020, which reflected the need for reliable information and knowledge in various research areas regarding the repercussions of COVID-19.

It is concluded that public health nutrition has the highest number of articles published on food marketing, with 26 articles and a relative weight of 6.3%. Appetite and International Journal of Environmental Research and Public health occupy the second and third places, with relative weights of 5.1% and 4.3%, respectively. These results are relevant to identifying the primary affiliations in article production in food marketing during the investigated period.

251topics were identified in the research, grouped into seven clusters named according to their central theme: (1) child nutrition, (2) food consumption in marketing, (3) food preference by gender and life stage, (4) food industry aimed at children, (5) food marketing, (6) food in health and economy, and (7) Europe. Each cluster is associated with publications according to the topics they comprise, allowing for contrasting the focus of each with their research lines and authors.

Finally, by analyzing the common topics between 2010 and 2023, the main ones identified were marketing, children, adolescents, obesity, sustainability, and local production. The analysis of the articles shows that in both periods, nutritional marketing focused on children, adolescents, and young people is studied, associating it with health problems such as overweight and obesity. Additionally, the persuasive capacity of adolescents exposed to sustainable marketing on social media is investigated. These results provide insight into the typical topics, their focus, and their relationship in the studied period.

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6. ANNEXES

Annex 1. Grouping of topics by cluster in the research line of food marketing during the period 2010-2023 (Source: own elaboration)

Cluster	Topics
Cluster 1	Nutritional value, children, food packaging, nutritional value, food intake, childhood obesity, nutrition, food labeling, child nutrition, sugar, pediatric obesity, comparative study, caloric intake, food advertising, nutritional, nutritional evaluation, soft drinks, snacks, sodium, healthy diet, nutrient content, saturated fatty acid, fat, food composition, childhood nutritional physiological phenomena, nutrient profile, sugar intake, supermarket, breakfast cereal, cheese, energy intake, cereal, chocolate, yogurt, classification, dairy product, bakery product, meat, carbohydrates, food handling, bread, ice cream, salt intake, health program, sweetening agent, fat intake, food analysis, ultra-processed foods, trans fatty acid, Brazil, nutrients, processed foods, epidemiology, price, ultra-processed foods, food labeling, and alcoholic beverage.
Cluster 2	Marketing, United States, public health, consumer, food supply, decision making, consumer behavior, statistics and numerical data, perception, consumption behavior, digital marketing, food consumption, video recording, risk factor, attitude, poverty, India, Spain, food security, dietary supplement, COVID-19, Vietnam, lifestyle, sustainability, influencer marketing, thematic analysis, theoretical study, Canadian, economic aspect, marketing strategy, developing world, China, retail, dietary supplements, organic foods, green marketing, data analysis, stakeholder, food production, strategic planning, agriculture, food products, organic farming, sustainable development, agricultural market, willingness to pay, food safety, and local food.
Cluster 3	Female, male, adult, food preference, diet, food preferences, eating behavior, advertising as a topic, Australia, advertising, school child, young adult, social marketing, choice, behavior, consumer attitude, mass media, child behavior, television viewing, middle age, New Zealand, shopping, health, psychology, self-report, public policy, media, parents, health behavior, eating habits, persuasive communication, healthy food, age, taste, awareness, education, nutritional health, environment, health attitude, household, restaurants, behavior, parent, socioeconomic factors, ethnic group, ethnicity, interpersonal communication, and packaging.
Cluster 4	Child, food industry, preschool child, preschool, child, nutrition policy, legislation and jurisprudence, health policy, government regulation, child health, food policy, government, law, food quality, infant, health policies, Chile, standards, baby food, regulation, dietary intake, dietary restriction, nutritional status, policy making, nutritional requirement, ethics, infant food,

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	legislation, food, legal aspect, management, breastfeeding, formula milk, regulatory framework, governance approach, self-regulation, organization and management, policy implementation, infant formula, social responsibility, marketing targeted at children, unhealthy foods, Thailand, and Latin America.
Cluster 5	Food, beverage, food marketing, advertising, adolescdrinkserages, fast food, television, obesity, social networks, internet, Canada, fast foods, policy, food environment, United Kingdom, unhealthy diet, adolescents, sugary drinks, youth, exposure, public figure, Mexico, adolescent nutrition, adolescence, sugary beverages, sweet, monitoring, restaurant, soda, mobile app, self-regulation, marketing targeted at children, alcohol, and digital.
Cluster 6	Health promotion, catering service, economy, fruits, vegetables, commercial phenomena, food, school, schools, milk, outcome assessment, randomized controlled trial, food assistance, vegetables, information processing, meals, food services, ethnology, healthy diet, neighborhood, and data collection.
Cluster 7	Europe

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