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Hot Topics, Trends and Insights in the Field of Food Parenting Research: Data Visualisation and Analysis Based on CiteSpace

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Abstract: Using 1,403 food education-related documents indexed in China National Knowledge Infrastructure (CNKI) from 2015 to 2025 as the sample, this study employs bibliometric analysis and visualization techniques. Leveraging CiteSpace to construct a knowledge map, it reveals the research landscape and evolutionary characteristics within this field. Findings indicate that while China's food education research has reached a certain scale, its quality requires improvement. Theoretical discussions are abundant, but practical explorations remain weak. Research subjects primarily focus on preschool-aged children, with insufficient attention to basic education and higher education. Keyword analysis reveals that research focuses on "food education curriculum," "dietary behavior," "cultural inheritance," and "learning from Japanese experiences." Existing research is largely confined to education studies, with insufficient interdisciplinary integration, limiting both theoretical depth and practical applicability. Future development requires multi-path approaches to advance systematic and in-depth research: breaking down disciplinary barriers to broaden perspectives and promote cross-disciplinary integration; fostering research communities to enhance collaborative problem-solving capabilities; and balancing theory with practice by strengthening curriculum implementation and effectiveness evaluation to promote high-quality development in food education research.

Keywords: Food Education; Bibliometrics; CiteSpace; Hot Spots; Trends.

1. Introduction

The concept of food education is rooted in the deep concepts of traditional Chinese food culture, especially the core essence of the ideas of "medicine and food have the same origin", "heaven and man correspond", and "etiquette begins with food", which reflects the relationship between food and ethics, health, nature and the environment. It embodies the intrinsic connection between food and ethics, health and nature. The so-called food education refers to the systematic educational practices implemented for children through the medium of food, aiming to help them establish a scientific knowledge of food, understand the interactive relationship between diet and individual health, pass on the traditional Chinese dietary civilisation, and broaden their understanding of the social structure and the ecosystem, thus cultivating an awareness of ecological and environmental protection, and encouraging them to develop a sustainable way of life. In recent years, the state has successively issued policy documents such as the "Outline of the "Healthy China 2030" Plan" and the "National Nutritional Dietary Action Plan for Children and Young People (2019-2023)", which clearly point out the strategic significance and practical needs of promoting food education. Under this policy orientation and social background, academics have extensively explored the topic of food education and accumulated fruitful research results. This study takes the relevant literature included in the China Knowledge Network (CNKI) database from 2015 to 2025 as the research samples, makes comprehensive use of bibliometric analysis and visualisation techniques, and draws a knowledge map with the help of CiteSpace tools, to systematically sort out the development of the research on food education in China in the past decade, the core issues and academic hotspots, and to put forward forward prospective judgments on the future research direction accordingly.

2. Research Design

In this study, a total of 1,635 pieces of literature related to food education in China in the past ten years from 2015 to 2025 were searched using the China Knowledge Network Database (CNKI) as the search platform and "food education" as the keyword (the search time is up to 31 December 2025). After excluding non-academic and irrelevant literature such as newspapers and conferences, 1,403 valid articles were finally obtained. With the help of CiteSpace (5.8R1) software tool, the collected 1,403 literatures were analysed in depth, the annual distribution of related literatures was measured and analysed using bibliometrics, and CiteSpace was used to draw the author cooperation mapping, keyword co-occurrence mapping, keyword clustering mapping, and time-zone mapping, so as to summarize the hot areas of the research on food education. On this basis, the shortcomings of current food education research are distilled, and the future research trends are prospected.

3. Research Findings and Analyses

3.1. Annual Distribution of Literature

The chronological distribution of academic literature can serve as an important basis for judging the evolution and dynamic trend of a specific research field. Based on the Excel platform, the present study has conducted econometric processing and visualisation of 1,403 pieces of effective literature related to food education, and drawn the annual trend of publications in this field from 2015 to 2025 (see Fig. 1). The data show that in the past decade, the academic output of food education research in China as a whole has shown an

upward trajectory under fluctuating dynamics, which can be divided into two typical phases: the first phase is from 2015 to 2018, which is in the initial accumulation period and the speed of development is relatively sluggish. In the early part of this stage, the academic community paid limited attention to it, the number of research results was small, and high-level and core journal articles were particularly scarce. Since 2018, the field has entered a phase of rapid development, with the number of articles significantly climbing, especially reaching a peak in 2025, totalling 267 articles, the most ever.

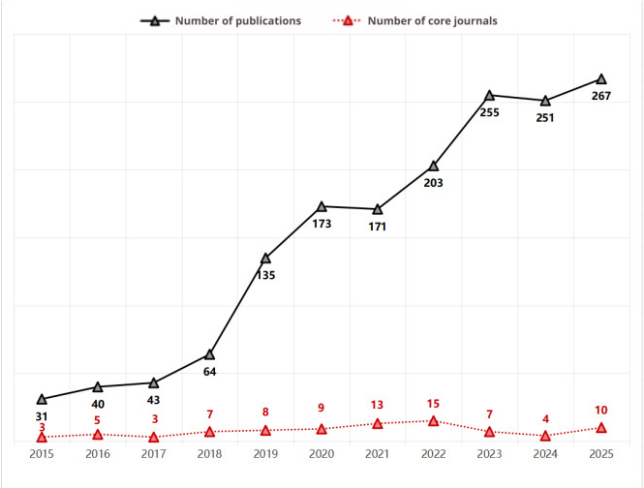

Fig 1. Annual distribution of domestic food education research from 2015 to 2025

This increase may be closely related to the fact that "food education" was included in the discussion topics of the National People's Congress and the National People's Political Consultative Conference in 2019, and as a key initiative to promote the strategy of "Healthy China", it has gradually gained policy support and social recognition, thus promoting the development of the field. As a key initiative to promote the strategy of "Healthy China", it has gradually gained policy support and social recognition, thus promoting the increase of academic attention.

However, from a comprehensive point of view, the current research in the field of food education in China is still in the early stage of exploration, the scope of research is not yet extensive, and high-quality academic results are still scarce - during the period from 2015 to 2025, there are only 84 relevant papers published in the core journals, which reflects that the overall depth of the research and the academic level still has much room for improvement. Therefore, in the future, it is necessary to further expand research horizons and deepen theoretical discussions in order to promote the development of the field in the direction of systematisation and specialisation.

3.2. Literature Authorship

The systematic sorting of academic outputs and collaborative relationships among researchers helps to grasp the distribution pattern and synergistic network characteristics of core research forces in the field of food education research in China. In this study, with the help of CiteSpace visual analysis tool, we set the node type of the network as "authors", and extracted the six clusters with the highest frequency of collaboration for analysis, and constructed a knowledge map of authors' collaboration in the field of food and nutritional research (see Figure 2). The network contains 337 nodes and 164 edges, and the network density is only 0.0029. Even if the node threshold is adjusted to the maximum, the size of each author node is still generally small, indicating that no leading scholars with significant academic influence have emerged in the field. Meanwhile, the weak connectivity between the nodes reflects the low intensity of cooperation between research subjects and the insufficient academic interaction, which has not yet formed a close research collaboration community.

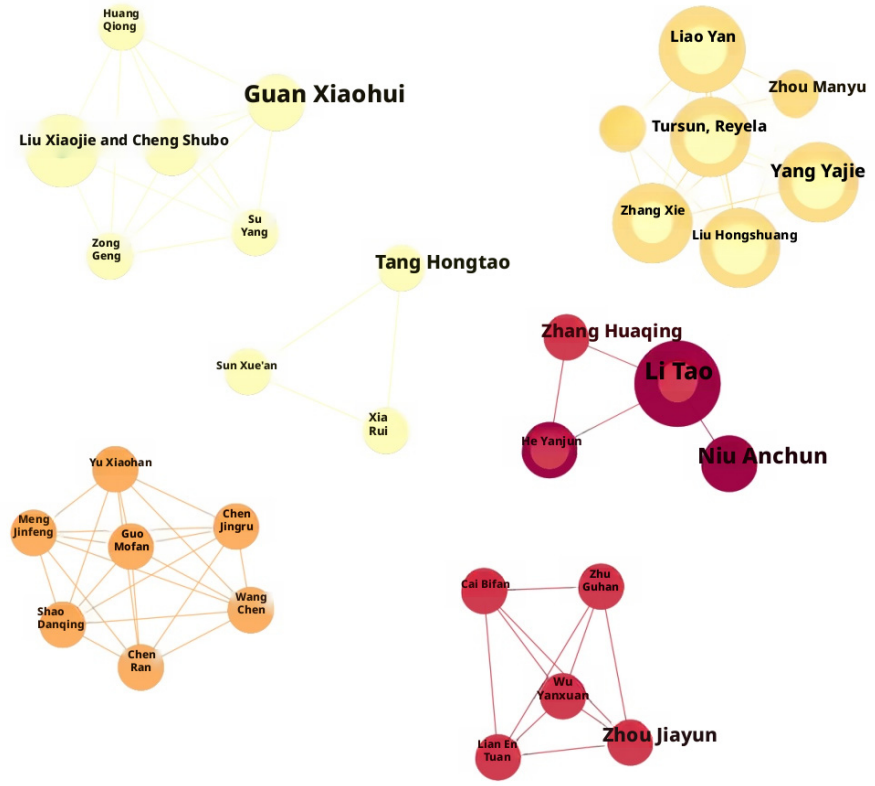

Fig 2. Knowledge map of cooperation between authors in food breeding research

3.3. Analysis of Research Hot Spots

In the CiteSpace software environment, "keywords" were selected as the node type for network analysis, the time slice was set as 1 year, the top 50 keywords in each time segment were selected as the threshold criterion, and the Pathfinder algorithm was used to trim the co-occurrence network. After the operation, the keyword co-occurrence knowledge graph of research in the field of food education from 2015-2025 was constructed (see Figure 3), which contained a total of 377 nodes with 390 connecting relationships, and the overall network density was 0.0055, indicating that there is still room for improvement in the degree of correlation between nodes. Through the statistical analysis of the frequency of keywords, it helps to systematically grasp the focus of disciplinary development, the distribution of research subjects and the trend of academic hotspot evolution in a specific period. The size of the circle of each node reflects the frequency of the corresponding keywords, and the larger the size, the higher the frequency of the term being explored in the literature and the stronger the academic attention. The connecting lines between the nodes characterise the co-occurrence relationship between the keywords, and the thickness of the connecting lines is positively correlated with the frequency of co-occurrence between the two. In addition, the font size of keyword labels is directly proportional to their centrality in the co-occurrence network, and the larger the font size, the more central they are in the network, and the higher the likelihood that they will form co-occurrence relationships with other terms. In this study, keywords with a frequency of no less than 10 occurrences are defined as high-frequency keywords, and a total of 25 such terms were identified. In descending order of frequency, they are: food education, kindergarten, food education curriculum, early childhood, food culture, Japan, labour education, eating habits, food education activities, early childhood education, early childhood food education, food education, strategies, countermeasures, university students, health, thematic activities, implementation strategies, curricula, health education, food safety, children, food education, eating behaviour. The above terminology focuses on the main topics and directions of concern in current domestic food education research (see Table 1).

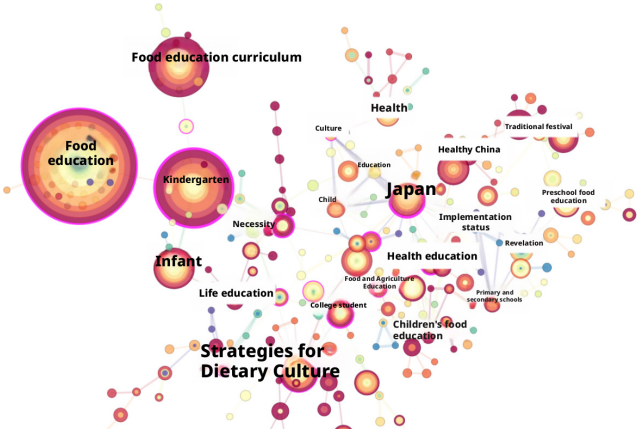

Fig 3. Keyword co-occurrence knowledge map of food education research in China, 2015-2025

It is worth noting that although the term "strategy" has a high frequency, its centrality indicator is low, suggesting that it appears as an independent topic in the knowledge network, with less connection to other core concepts, limited mediation, and not yet forming a broad knowledge fusion. Therefore, future research should strengthen the integrative exploration of this type of high-frequency but low-centrality topics, and promote the in-depth construction of the theoretical system and the development of cross-topic correlation research.

Table 1. High-frequency keywords of food education research in China from 2015 to 2025

Freq	Centrality	Keyword
307	0.28	Food
142	0.43	Kindergarten
93	0.1	Food and education programmes
45	0.1	Early Childhood
39	0.17	Food culture
30	0.51	Japan
25	0.04	Labour education
25	0.03	Eating habits
23	0.02	Food education activities
23	0.02	Early childhood education
16	0.05	Early childhood food education
16	0.05	Food education
15	0.26	University students
15	0.11	Countermeasures
15	0	Strategies
14	0.08	Health
14	0.08	Revelation
13	0.38	Implementation Strategies
13	0.03	Theme Activity
12	0.03	Curriculum
11	0.22	Health Education
11	0.06	Children
11	0.03	Food Safety
10	0.15	Eating behaviour
10	0.07	Dietary education

As an analysis method based on thematic clustering, keyword clustering is able to systematically reveal the inherent thematic architecture of a specific research field by categorising and integrating the term collection, thus overcoming to a certain extent the limitations of traditional co-occurrence analysis in terms of clustering ability. On the basis of completing the construction of the keyword co-occurrence network, in order to further condense the research themes, this study introduces the clustering analysis technique to categorise and identify the high-frequency keywords, and selects the first six clusters with higher modularity value (Q-value) and larger scale for in-depth analysis (see Figure 4). By combining the structural characteristics of the co-occurrence network and the clustering results, a number of representative research foci were finally integrated, including "food education curriculum", "food education", "Japanese (food education)" "food culture", "countermeasures", and "healthy China". These theme clusters not only reflect the density of association between keywords, but also reflect the core

concern of academics on the topic of food education from 2015 to 2025, which constitutes the main knowledge vein and academic growth point of current research on food education in China.

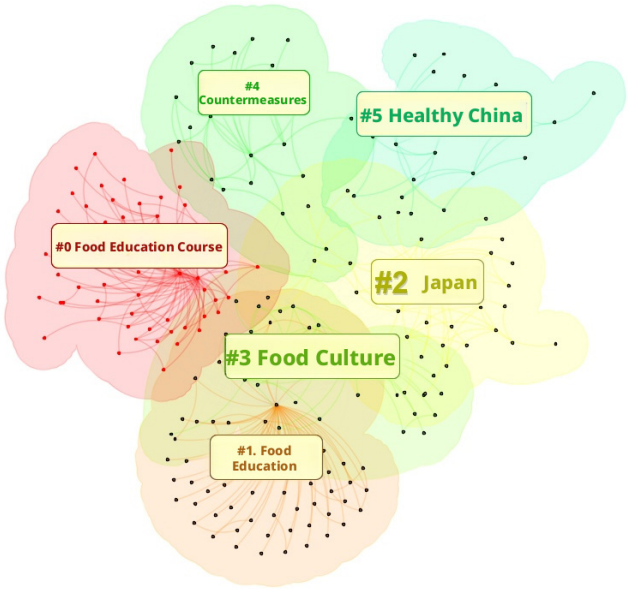

Fig 4. Cluster Label View of Food Education Research in China, 2015-2025

Cluster #0 focuses on the core issue of "food education curriculum", which covers a number of key subfields such as pre-school education institutions, labour literacy cultivation, food education practical activities, interdisciplinary integration curriculum and traditional culture integration, indicating that food education curriculum has become one of the important focuses in the field of food education research. Through the systematic combing and in-depth analysis of the existing literature, the current academic discussion on food education curriculum mainly focuses on two dimensions: one is the distribution of school segments, and the research mostly focuses on the pre-school education stage, especially on the curriculum construction at the kindergarten level; and the other is the structural distribution of the research content, and the existing results are mostly devoted to the overall structure of the curriculum system, covering the setting of curricular objectives, content organisation, implementation path, value orientation and the creation of educational environment. The second is the structured distribution of research content, with existing results mostly devoted to the overall structure of the curriculum system, covering core elements such as curriculum goal setting, content organisation, implementation path, value orientation and creation of educational environment. Taking Zhang Qiuping's research as an example, she proposes that the design of kindergarten food education curriculum should be based on the laws of children's physical and mental development, the enhancement of natural cognitive ability, and the educational concept of cultural inheritance. In terms of goal construction, it is advocated that the curriculum goal system should be established in four dimensions, namely, knowledge cognition, practical ability, emotional attitude and cultural identity; in terms of content design, it is suggested to build a curriculum content framework covering five dimensions, namely, food cognition, farming experience, nature exploration, body cognition and kitchen practice, with the aim of helping children not only to master the knowledge of food itself, but also to deeply understand the intrinsic connection between food and nature, life and culture. In addition, the evaluation mechanism of the programme is designed to help children not only master the knowledge of food itself, but also deeply understand its connection with nature, life and culture. In addition, in terms of curriculum evaluation mechanism, it is suggested to establish a "food education growth file" for each child, through which teachers and parents collaborate to record his/her performance in food education activities, and collect and save his/her works and related narratives, so as to achieve an organic combination of process observation and diversified evaluation[1]. Based on Wang Yingyan's research results, the food education curriculum system in kindergarten should be based on the ontological knowledge of food, focusing on deepening children's knowledge and ability to operate on the food itself, its processing methods and consumption practices, and at the same time, organically integrating the growth process of food, regional food cultures and other related contents, so as to achieve the systematicity and cultural nature of the educational content. In order to guarantee the scientificity and effectiveness of food education practice, it is recommended that kindergartens build a special food education practice place as an important support platform for curriculum implementation; set up an interactive mechanism for home education through the establishment of food education lecture halls and operation workshops, etc., to promote the in-depth participation of parents; and actively develop and integrate the food education resources at the social level to expand the educational field and build a multifaceted and synergistic support network for food education, so that the boundaries of the kindergarten and the educational resources can be broken through and the educational resources can be utilised to achieve the goals of the kindergarten. In order to break through the boundary of gardens, the openness and sharing of educational resources can be realised[2]. In the exploration of the practical path of food education curriculum, Jing Dongju and Niu Liping focus on the implementation of food education in preschool education, systematically discuss the promotion strategy of food education activities at kindergarten level, and put forward a number of operational suggestions for educational institutions and frontline teachers. The study advocates the organic penetration of food education elements in the day-to-day life of young children in kindergartens, and the achievement of educational goals through diversified implementation paths. Specifically, the study suggests that food education should be taught in the form of micro-courses; nutrition education should be integrated into daily meals; food education should be integrated into play and regional activities; food education environments should be created in order to enhance immersive experiences; food education activities should be organised on a regular basis with distinctive themes; food education curricula should be developed with garden-specific characteristics; the nurturing value of food education picture books should be fully explored; the dimension of education should be expanded by means of the Internet and information technology; and the educational objectives should be achieved by means of the Internet and information technology. Expanding the dimensions of education by means of the Internet and information technology; systematically integrating food education into group teaching; building physical food education practice bases to support experiential learning; building a systematic food education resource base to achieve

resource sharing; and adopting a hybrid mode combining online and offline to promote the collaborative development of food education practices between families and kindergartens. The above strategies aim to guide children to perceive and understand the deeper connotation of food culture, improve their health literacy and cultivate scientific eating behaviour patterns through multi-dimensional, multi-subject and multi-scenario educational interventions, thus promoting their overall healthy physical and mental development[3]. The research team of Wang Yu, Zeng Yan and Huang Chengjia constructed a systematic curriculum framework based on the "Knowing, Believing and Doing" behavioural intervention model and the basic theory of food education. Through the experimental research design, an empirical method was used to quantitatively assess the effectiveness of the programme. The results of the study show that the food education curriculum system developed based on the theoretical model of "Knowing, Believing and Acting" has shown significant intervention effects in improving the knowledge level of young children's diets, optimizing their eating attitudes, and promoting healthy eating behaviours, thus verifying the scientific validity and feasibility of the model in shaping the dietary behaviours of young children[4].

Cluster #1 Food education, in recent years, as an emerging research topic, diet education has received increasing attention from the domestic academic community, forming a cluster of concern centred on "food education". This research cluster covers several key dimensions, including adolescent groups (especially represented by secondary school students), the construction of dietary concepts, the necessity of food education, the cultivation of dietary etiquette, and related practical intervention strategies. The above research themes have systematically mapped out the trajectory of academic exploration in the field of food education in China over the past decade. From the perspective of research paradigm, the existing results mainly focus on the construction of theoretical system and the summarisation of practical experience, in which the theoretical level dominates, while the empirical and applied research is still in the stage of gradual development.

Cluster #2 Japan focuses on the study of Japanese food education, and its core issues cover the practical experience of food education in Japan, policy and legislation (e.g., the Basic Law on Food Education in Japan), the current implementation status, and its reference value for China, and other key dimensions. Compared with the mature system of food education in Japan, which has been developed over the past century and has become popular among all people, the academic exploration of food education in China started later. According to the literature, it was not until 2006 that the concept of "food education" was first introduced to the domestic academic field by Professor Li Ritter of China Agricultural University. Against this background, the development of food education in Japan has become an important orientation of relevant research in China in recent years. Based on the systematic sorting of the existing research results, it can be found that the current domestic research on food education in Japan is still mainly focused on the theoretical introduction and comparative analysis level, focusing on the evolution of its concept, system construction and education practice mode of induction, and to further explore the significance of its inspiration for the construction of China's food education system. For example, Ding Nuozhou and Zhang Min systematically clarified the generation and development logic of the concept of "food education" in Japan, and deeply explained the deep-seated motivation for the concept to be widely rooted in Japanese society and its future direction[5]. Based on the comparative analysis of the contents of food education in primary schools in the United States and Japan, Zhu Qiang, Li Feng and Wang Jinqiu systematically discuss the construction path of China's future food education system and put forward some key concepts. Firstly, food education should be a continuous educational practice throughout the whole process of basic education, and should be implemented from the early school years, and be guaranteed and promoted by an institutionalised framework; secondly, the curriculum design should reflect the stage and appropriateness, focusing on the cultivation of dietary behaviours, the inheritance of dietary culture, and the knowledge of food diversity, and focusing on improving the learners' ability to practice dietary practices and their life literacy; and thirdly, future academic Third, future academic research should pay more attention to the dietary structure and behavioural characteristics of children and adolescents of different ages, and shift the focus of research to the differential analysis of students' dietary behaviours and the precise construction of intervention strategies in each school section[6]. Based on the perspective of curriculum integration, Wang Shijuan, Li Xiuju and Gao Huichen focused on the four core dimensions of "motivation for integration", "subject composition", "content scope" and "implementation path". Based on the four core dimensions of "motivation for integration", "subject composition", "content scope" and "implementation path", the integration mechanism of the Japanese food education curriculum is systematically analysed. Through the multi-dimensional perspective of its system design and practice mode, it reveals the operation logic of Japanese food education in terms of interdisciplinary synergy and educational resources coordination, and accordingly extracts a number of revelations with reference value for the construction of China's food education system, which provides theoretical references and practical reference for the exploration of the integration path of localised curricula[7]. On the basis of clarifying the basic concept of "food education", Su Jia, through systematically sorting out the implementation system and practice development of food education in Japan, proposes to promote the comprehensive development of China's food education cause by further improving the construction of the food education system and the top-level design, constructing the teaching system of food education with the focus on school education, and establishing a comprehensive food education model under the participation of multi-social subjects, and so on. The cause of comprehensive development[8].

Cluster #3 Food culture focuses on the research theme of "food culture", which covers a variety of sub-topics such as early childhood food education, Japanese food education experience, food culture inheritance education, food education practice based on the 24 solar terms, and traditional Chinese food education culture. Given the close relationship between food culture and food behaviour patterns, and that the latter can be regarded as an important part of the former, the two are often discussed in an integrated manner under a unified analytical framework. As a short form of dietary education, food education not only carries a long history, but also has its cultural embryonic form as early as in ancient China. Food education is deeply intertwined with dietary practices, which is not only the core path to inherit and promote national dietary traditions, but also a key means to

cultivate healthy dietary behaviours; at the same time, traditional dietary culture also constitutes an important foundation and resource for the construction of a modern food education system. Existing researches generally focus on the interaction between food education, food culture and eating habits, which can be summarised into two main research orientations after systematic sorting: firstly, they emphasise the necessity and value of integrating traditional food culture and food education; secondly, they regard food culture as the core content and effective carrier for the implementation of food education. For example, based on the excellent traditional Chinese dietary culture, Li Xiaoyan has extracted the far-reaching concepts of food education such as "medical food has the same origin", "dietary moderation" and "dietary etiquette", etc., and analysed the relationship between traditional dietary wisdom and the development of contemporary food education in depth. It also analyses in depth the intrinsic connection between traditional dietary wisdom and the development of contemporary food education, points out the dynamic role of food education in cultural inheritance, and stresses the supportive function of traditional culture for the development of modern food education. However, the current practice of food education in China still faces multiple challenges, such as the extensive penetration of Western fast food culture, low public awareness of food education and lagging behind in institutionalisation. Therefore, there is an urgent need to promote the deep integration of traditional food culture into the modern food education system by enhancing the dietary literacy of the whole population, accelerating the legislative process of food education, perfecting the multi-level education system, and advancing regional pilot practices, in order to explore a path of development of food education of Chinese characteristics rooted in the local culture and with the characteristics of the times [9]. Zhao Jiechang pointed out that although China has a profound and rich food culture, the introduction and promotion of food education as a systematic educational concept and practice is relatively lagging behind. Against the backdrop of the current transformation of the social dietary structure and the intensification of health challenges, there is a high degree of urgency and practical necessity to carry out food education. In order to effectively improve the effectiveness of food education, it is necessary to draw on international advanced experience and build a localised and systematic mechanism for promoting food education. Specific paths include: strengthening the inheritance and dissemination of traditional food culture and integrating it into the education content system; adopting diversified and contextualised food education implementation strategies to enhance the appropriateness and participatory nature of education; and at the same time, enhancing the government's governance capacity in policy formulation, resource co-ordination and implementation and supervision to enhance the effectiveness of the implementation of food education policies, so as to promote the conceptual advocacy of food education to the development of systematic and normalization [10].

Cluster #4 Countermeasures focuses on the research topic of "Countermeasures for food education", and its subcategories cover the dimensions of food education implementation strategies, educational dilemmas, food education practices in primary schools and countermeasure studies. Through systematic sorting and in-depth interpretation of relevant literature, it is found that the current academic discussion on the countermeasures of food education mainly focuses on the two stages of pre-school education and compulsory education, with kindergarten, primary and secondary schools as the focus of research. In the field of pre-school education, Jia Lei and Zhou Xingyu used a multifaceted research method combining literature research, questionnaire survey and field observation to examine the realities of food education practices in public kindergartens in counties and townships, and to identify the main obstacles and underlying causes in the process of promoting food education. Based on the results of the empirical analysis, the study proposes that the implementation path of food education in kindergartens should be optimised at multiple levels: first, improve the relevant policy support system and strengthen policy guidance and social awareness; second, organise diversified and systematic teacher training and parent education activities; third, strengthen the development of kindergarten-based food education curricula and the construction of teaching resources; and fourth, give full play to the function of the collaborative education mechanism between families and kindergartens to promote home education in the practice of food education. Fourth, give full play to the function of the mechanism of collaborative parenting between families and kindergartens to promote the in-depth integration of home and family co-education in the practice of food education[11]. Zhao Junmei used a research paradigm combining questionnaire research and field observation to systematically investigate the current situation of kindergarten food education in Z city. The study found that kindergartens in this region face multiple constraints in the process of food education practice, mainly manifested as: teachers' knowledge of the concept of food education is still shallow, lacking in systematic theoretical understanding and practical ability; the infrastructure configuration of food education in kindergartens is insufficient, and the hardware support system is yet to be perfected; the teaching space and teaching aids are limited, which restricts the effective development of educational activities; at the same time, there are cognitive bias towards food education goals at the family level, and parents' participation in food education is limited. At the same time, there is a bias in the family's perception of the goals of food education, low parental participation and weak willingness to support. In view of the above problems, the study suggests that we should start from strengthening the professional development of teachers, systematically promote special training in food education, and improve the curriculum implementation ability of teachers; we should also make efforts to build a mechanism for home and family collaboration, enhance the recognition of parents on the value of food education through diversified communication channels, and promote the organic convergence between families and kindergartens in terms of educational goals and practices, so as to improve the implementation quality and effectiveness of food education in kindergartens in the region as a whole[12]. In terms of the countermeasures of food education in primary and secondary schools, Wang Jinping pointed out through systematic analysis that food education has important humanistic values and social functions. Strengthening the physical health of young people and improving their public safety literacy and emergency response ability not only meets the inherent needs of the modernisation of the national public safety governance system, but is also a key link in achieving the strategic goal of "Healthy China". However, the practice of food education

in primary and secondary schools in China is still in the initial exploration period, facing multiple practical bottlenecks such as insufficient institutional support, uneven distribution of resources, and unsound implementation mechanisms. In order to promote the effective implementation of food education in the basic education system, it is necessary to build a government-led, school-implemented, family-coordinated, social participation in the multi-body linkage mechanism, to form a synergistic promotion of the development of food education ecological resources sharing[13].

Based on a systematic study, Yan Bing and Luo Yanyan suggest that the content of school-based food education programmes for primary and secondary schools can be constructed from three dimensions: individual development, practical ability and social cognition. Curriculum design should be rooted in local cultural contexts and real-life experiences, focusing on students' individual-level body awareness, emotional connection to food, and cultivation of health values, and systematically integrating operational knowledge such as food selection, food handling, meal preparation, and eating behaviours, so as to strengthen the practical orientation. At the same time, learners should be guided to understand the deeper meaning of food culture, the mechanism of food production, circulation and distribution, and explore the relevance of food and sustainable development of the society, so as to broaden their social horizons. In the process of curriculum development, it is necessary to pay attention to the stage-by-stage progression of goal setting, to ensure the geographical appropriateness of content selection, and to advocate the organisation and implementation of the curriculum in a life-oriented and contextualised way, so as to enhance the operability and educational effectiveness of the curriculum[14].

Cluster #5 Healthy China focuses on the development of food education in the context of the "Healthy China" strategy, which covers a number of subdivided research directions, including the promotion of health for all, the cultivation of food literacy, the design of food education immersion, the development of food culture derivatives, and the practice of children's nutrition education, etc. Existing academic discussions are mostly centred on the "Healthy China" strategy, with the majority of them focusing on the development of food education. Existing academic discussions have mostly focused on systematic analyses of the practical constraints, coping strategies, and promotion mechanisms of food education programmes within the framework of the "Healthy China" policy. Among them, Li Yannan systematically examined the structural barriers to early childhood food education in the process of promoting the national strategy, and revealed the deep-rooted problems in the promotion of food education from the dimensions of institutional construction and teaching implementation. Based on this, the study proposes a four-dimensional intervention path: first, promote the formulation and implementation of laws and regulations related to food education to strengthen institutional safeguards; second, widely disseminate nutritional and dietary knowledge to the public, and simultaneously enhance the professional competence of educators; third, integrate contextualised teaching modes and practical curriculum design to enhance the learning experience; and fourth, build a multi-dimensional collaborative education mechanism that focuses on the community, schools and families to integrate educational resources and achieve a better understanding of the needs of young children. Fourth, to build a multi-dimensional collaborative education mechanism with society, school and family as the core to achieve the integration and linkage of educational resources[15]. Lv Huiwen took the college students of Nanjing Tourism Vocational College as the research object, and through rooting food education in classroom teaching, actively carrying out the construction of school healthy canteen, leading students to carry out scientific research, as well as through the penetration of Chinese traditional dietary culture and rich and colourful campus activities, to cultivate contemporary qualified college students with strong health literacy and comprehensive ability in the new era. In order to comprehensively improve the college students' own health literacy and level, a set of college students' food education and education application research results that can be used for promotion has been constructed with the new era college students' food education and education model as the core, the penetration of Chinese traditional diet culture as the base, the construction of the food education and education system, the innovation of dissemination paths as the breakthrough point, and the cultivation of the academic research highland and construction of nutritional and health canteens as the innovation point. Carrying out research on food education in colleges and universities, through the "tripartite linkage" of students, teachers and schools, and with the help of research and practice in five dimensions, the level of students' health literacy from thought to behaviour has been comprehensively improved in a "two-way interoperability", which provides theoretical and practical support for the construction of a food education talent cultivation system that suits the needs of colleges and universities. To provide theoretical and practical support for the construction of a food education talent cultivation system suitable for the needs of colleges and universities [16].

4. Analysis of Research Trends

In order to deeply explore the development and dynamic characteristics of the research in the field of food education in China between 2015 and 2025, this study constructed a time zone distribution mapping (as shown in Figure 5) based on the co-occurrence and clustering results of keywords in the literature, and with the help of the "TimeZone View" function in CiteSpace software, the distribution of the keywords as the nodes of the network is shown in Figure 5. The map (shown in Figure 5) is used to visualise the evolution trajectory of the research topics in this field in the time dimension and their intrinsic association. The map not only reveals the stage-by-stage emergence and evolution of each research topic, but also reflects the interaction between different topics, thus providing a visual analysis basis for grasping the overall development trend of food education research.

In the evolution of research hotspots and hotspots, burst terms, as an important indicator reflecting the sudden increase in academic attention, has significant research and judgement value. By integrating the intensity and temporal distribution of keywords, we can more accurately grasp the generation mechanism of disciplinary research hotspots and their evolution paths. In this study, we used the emergent word detection function in CiteSpace software to detect the literature data in the field of food education research in China from 2015 to 2025, extracted the keyword collections with significant emergent characteristics, and then revealed the leaping process of academic focus during this period (see

Figure 6).

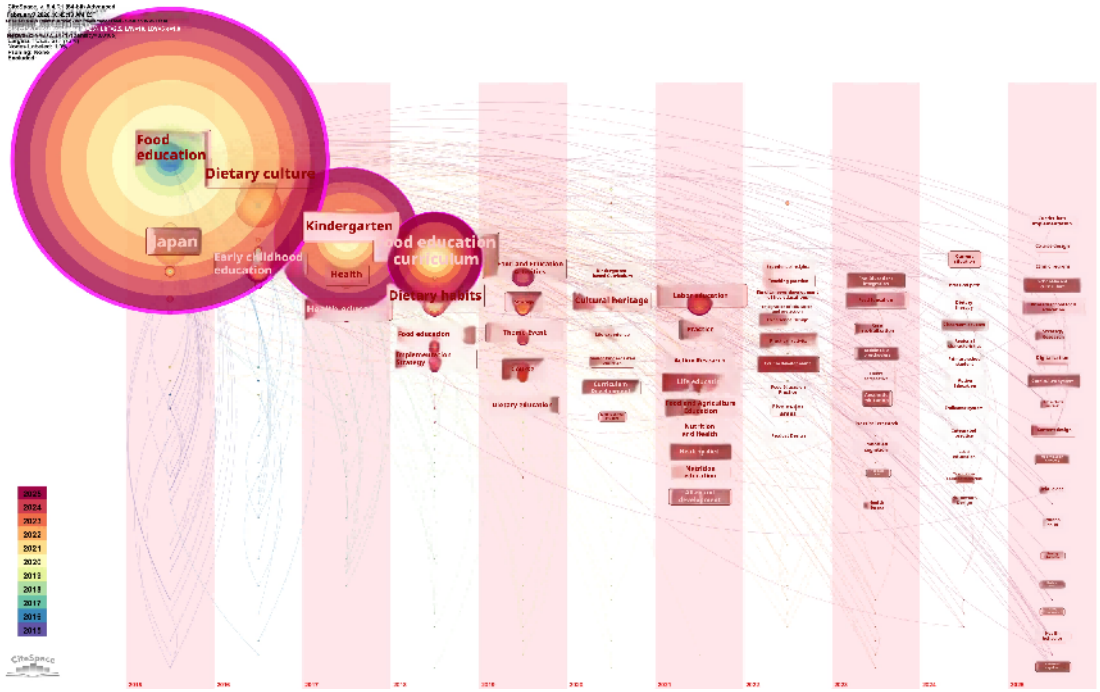

Fig 5. Time-zone mapping of research hotspots of food education in China from 2015 to 2025

Top 5 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2015 - 2025
Revelation	2015	4.14	2015	2018	
Food safety	2016	2.71	2016	2020	
Dietary behavior	2017	2.83	2017	2021	
Labor education	2019	2.57	2019	2021	
Food and Education Culture	2021	2.96	2022	2025	

Fig 6. Keyword emergence of food education research in China from 2015 to 2025

Based on the analysis of the time zone mapping and the keyword mutation map, the research history of food education in China from 2015-2025 is divided into the following three stages.

4.1. Starting Stage (2015-2017)

The research hotspots in this stage show diversified characteristics, with core keywords covering multiple dimensions such as dietary literacy, Japanese experience, dietary culture, pre-school education, early childhood education institutions, health promotion and health popularisation. The research focuses on the significance of international food literacy practices on China's development path and the exploration of food literacy practices for preschool children. From the results of keyword emergence analysis, many terms with high emergence intensity emerged at this stage, with the terms revelation, food safety and eating behaviour being particularly significant. In particular, the term revelation had the highest burst strength (burst strength=4.14), indicating that academics in this period were particularly concerned about the reference value of Japan's practical experience in the construction of a food education system for China. The research paradigm has gradually shifted from theoretical introduction to practical application, focusing on the development and implementation mechanism of food education programmes at kindergarten level. Specifically, the research mostly focuses on the path of curriculum implementation, advocating the promotion of food education practice through thematic educational activities, emphasising the creation of an immersive food education environment, and focusing on the organic integration of the elements of the excellent traditional Chinese food culture into the curriculum content, so as to realise the dual goals of cultural inheritance and the cultivation of health literacy.

4.2. Slow Development Stage (2018-2020)

Entering this stage of development, the focus of the research gradually focuses on the construction and implementation of the food education curriculum system, marking the deepening transformation of the research theme from macro-conceptual exploration to specific educational practice. The core keywords include food education curriculum, food education, food education activities, cultural inheritance, etc., in which food education curriculum becomes the most representative research topic, and its academic attention is in the first place. Based on the current research trend, it is inferred that food education curriculum will still occupy the core position of academic discussion in the coming period, and is expected to give rise to a new round of active research period. From the dimension of research objects, existing research still mainly focuses on the practice of food education in the preschool stage, reflecting the continuous attention to the early childhood group. At the same time, the research paradigm is undergoing a systematic shift from theoretical introduction to practical exploration, especially in the development and operation mechanism of kindergarten food education programmes, forming a more concentrated research cluster. In practice, thematic teaching activities have been widely adopted as a vehicle for implementation, and research has emphasised the systematic design of educational contexts, focusing on the embedding of elements of the excellent traditional Chinese food culture into the curriculum content, in order to realise the goal of integrating value guidance and literacy cultivation. However,

the overall research is still limited in terms of the breadth of topics and the coverage of the target audience, presenting a concentrated theme and a relatively narrow scope. Therefore, future research needs to break through the existing framework and expand to different school years, diversified fields and interdisciplinary integration, in order to promote the integrity and diversity of the food education research system.

4.3. Sustained Development Phase (2021-2025)

In this research phase, the focus of academic attention is gradually shifted to labour education, practical teaching and action research, with labour education becoming the most prominent research hotspot, ranking among the top in terms of academic visibility and research intensity. With the deepening of cross-domain integration research on labour education, living education, food and agriculture integration education, and nutrition and health education, a large number of fine-grained research nodes are presented between 2021 and 2025, reflecting that the academic trend of cross-integration of food education and multi-dimensional education topics is gradually forming and expanding. In terms of the distribution of research objects, although research still focuses mainly on curriculum practices at the preschool level, food education is no longer regarded as an independent and fragmented educational module, but is instead explored in the context of a broader educational ecosystem. Research has increasingly shifted to the integration mechanism and synergy path between FE and the five areas of kindergarten education, focusing on the strategic design and implementation mode of the integration process. Based on the current research trend, it can be expected that in the future, research on food education will pay more attention to cross-field and multi-dimensional educational integration, explore the synergistic effect and nurturing synergy among different educational themes, and the construction of relevant integration paths and strategy systems is expected to become the core development direction of the field to continue to deepen.

5. Conclusion and Prospect

This study employs CiteSpace visualization analysis tools to conduct a systematic quantitative analysis of domestic food education research literature indexed in China National Knowledge Infrastructure (CNKI) from 2015 to 2025. It aims to reveal the development trajectory and academic landscape of this field over the past decade. Through a comprehensive examination of both the scale of literature output and its academic influence, the study found that the volume of food education research publications exhibits a fluctuating growth trend, reflecting the sustained increase in academic attention to this topic. However, the overall academic depth and level of theoretical construction in the research still require improvement. At the research theme level, co-occurrence analysis of keywords indicates that food education, kindergartens, food education curricula, young children, food culture, and Japan constitute the core research topics during this period. From a research level perspective, existing work remains predominantly focused on theoretical exploration and conceptual development, with relatively scarce empirical and intervention-based studies. In-depth practice-oriented investigations remain insufficient. Regarding educational stages, research is highly concentrated on early childhood education, while food education practices and curriculum design in primary/secondary and higher education receive inadequate attention, resulting in uneven coverage across educational levels. From a disciplinary perspective, current research remains largely confined to the field of education. Interdisciplinary, multidimensional integrated studies have yet to gain significant traction, and the multidimensional academic dialogue required for food education as a comprehensive educational topic remains to be established.

By systematically tracing the evolution of domestic food education research over the past decade, this paper thoroughly analyzes its current status, phased achievements, and existing structural limitations. Looking ahead to future development, it proposes advancing this field in depth through three dimensions: First, broaden academic horizons by encouraging interdisciplinary integration among education, nutrition, public health, cultural studies, psychology, and other fields to construct a composite knowledge system for food education research; Second, establish a cohesive research community to enhance the originality and impact of findings through collaborative efforts, thereby elevating overall research quality. Third, prioritize both theoretical development and practical exploration by strengthening empirical studies in curriculum design, instructional interventions, and outcome evaluations. This will facilitate the transformation of food education from conceptual advocacy to institutionalized, scientifically grounded practices, achieving dual enhancement of academic and societal value.

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