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A bibliometric analysis of halal product literature: Research stream and future direction

Muhamad Subhi Apriantoro [1,*], Salsabilla Ines Sekartaji [1], Ahmad Nurrohim [1], Esty Setyo Utaminingsih [2]

[1]Faculty of Islamic Religion, Universitas Muhammadiyah Surakarta, Sukoharjo, 57169 Jawa Tengah, Indonesia
[2]Master of Elementary Education Program, Universitas Negeri Semarang, Semarang, 50229, Jawa Tengah, Indonesia

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ABSTRACT

This study investigates the development of halal products to predict future trends in halal product research. A bibliometric analysis was conducted on 786 entries from the Scopus database, covering the years 1998-2022. The analysis and visualization tools used include Scopus Analyze, VOSviewer, Biblioshiny, and Microsoft Excel. The number of studies on halal products increased significantly between 2016 and 2020 but has declined since 2021. Two key topics emerged from the research: halal products and the authentication of halal materials. Keywords related to halal products were used for searches in the Scopus database. The findings highlight that Rohman A is the most frequently cited author, Universiti Putra Malaysia is the leading institution, the Journal of Islamic Marketing is the most relevant source, and Rohman A remains the most influential author. The study concludes that the literature on halal products, especially in the areas of Islamic marketing, food science, economics, management, and the halal industry, is predominantly based in Southeast Asian countries like Malaysia and Indonesia.

1. Introduction

In recent times, individual awareness of halal labels has grown significantly. Halal awareness involves a strong commitment to ensuring that consumed products meet halal standards. Halal has become a global trend (Sukesi and Akbar Hidayat, 2019) and is now part of the lifestyle for many Muslims. Halal labels now apply to a wide range of products beyond just food and beverages, covering various goods that must adhere to halal guidelines. These guidelines include not only the halal status of the product itself but also the processes, materials, and marketing methods used. Halal standards encompass diverse categories, such as food, goods, and services (Karia, 2022). The term "halal" refers to substances that are considered pure and suitable for consumption by Muslims according to Islamic law. Halal awareness is recognized as a key factor in consumers' intention to purchase halal products. The increasing priority given to halal labels by consumers (Potluri et al., 2017) has led to extensive research on halal products. A product is a result of processes aimed at generating value, often involving an initial screening of materials and production methods (Utomo et al., 2020). Additionally, halal products must be free from prohibited elements, such as pork-based ingredients (Salleh et al., 2022) and alcohol used as additives in food and cosmetics, both widely consumed in everyday life.

This research evaluates previous halal product research through bibliometric analysis methods (Martí-Parreño et al., 2016), which produce development maps, author trends, relevant journal source trends, countries with popular affiliations, and research trends from 1998-2022. This is very important for the authors when recommending future studies on halal products.

2. Methodology

2.1. Data sources

This study uses bibliometric analysis, a commonly used method for exploring and examining large sets of scientific data (Apriantoro et al., 2023; 2024a). The analysis focuses on international journals from the Scopus database, utilizing VOSviewer and Biblioshiny software. Specifically, the metadata reviewed includes citation patterns, publication trends, author collaborations, popular topics, keywords, and abstract themes.

* Corresponding Author.
Email Address: msa617@ums.ac.id (M. S. Apriantoro)
https://doi.org/10.21833/ijaas.2024.09.024
Corresponding author's ORCID profile:
https://orcid.org/0000-0001-9059-9034

2.2. Data collection

In data collection we carried out three structured procedures. In the first stage, researchers conduct a literature review of related themes to ensure that the research is relevant. In addition, a literature review helps determine keywords that match the research theme. In the second stage, the data is collected from the Scopus database, which uses the keyword “halal product”. At this stage, the researchers used a boolean (TITLE-ABS-KEY (halal AND product) to perform a search on Scopus that resulted in 1,216 documents. Furthermore, a screening process was carried out using Booleans (TITLE-ABS-KEY (halal AND product) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j")) the result became 786 documents. Data was collected over an indefinite period from 1998-2022. The data search was conducted on September 07, 2022. In the third stage, the data collected after the screening results are stored as RIS files. Then the file is analyzed and visualized using VOSviewer, Biblioshiny and Microsoft Excel software. According to Hudha et al. (2020), VOSviewer can be applied to analyze and create graphical representations in the form of bibliometric maps. Furthermore, the data visualized by VOSviewer is processed independently using Microsoft Excel. This study used co-authorship and co-occurrence to map research development in publications. Meanwhile, bibliometric coupling is used to determine authorship trends through the most dominant networks. This research procedure can be seen in Fig. 1.

2.3. Data analysis

We used four bibliometric analysis tools: Scopus Analyze, VOSviewer, Biblioshiny and Excel. Scopus Analysis is used to generate analysis data based on databases on Scopus (Apriantoro et al., 2024b; 2024c). VOSviewer is used to analyze and visualize data on bibliometric networks. In VOSviewer analysis, this visualization is often called a map used to perform various network analyses, such as co-authorship, co-occurrence, and bibliographic coupling (Alshater et al., 2022). Biblioshiny (Rusydiana, 2021) is used to generate bibliographic data for datasets. Microsoft Excel makes reading on the result of visualization data from these three tools easier. It is also used to collect the database on Scopus, which has been screened and then analyze the database using Scopus. This section extracts public information about the data set and the growth of research over the years.

3. Results and discussion

3.1. Document analysis

Table 1 presents a general summary of the Scopus database collected as many as 1,216 documents through a screening process with the keyword "halal products" to 786 documents. Indefinitely from 1998-2022, the database collected is sourced from journals and books, as many as 324 documents. The average citation of each document is 14.93%, with a complete reference of 29795. The plus keyword (ID) is 1542. There is a collaboration between authors either individually or internationally, and the collaboration of authors of each document is 3.62%. The selected document type is only an article.

Table 1: General summary

Description	Results
Main information about data	
Timespan	1998:2022
Sources (journals, books, etc.)	324
Documents	786
Annual growth rate %	19
Document average age	4.55
Average citations per doc	14.93
References	29795
Document contents	
Keywords plus (ID)	1542
Author's keywords (DE)	2187
Authors	
Authors	2216
Authors of single-authored docs	71
Authors collaboration	
Single-authored docs	82
Co-authors per doc	3.62
International co-authorships %	18.32
Document types	
Article	786

Fig. 2 shows relevant or frequent authors who publish halal product research. Rohman A was the most influential author, with 33 articles published. Then Ali Me was second with 12 articles published. In the third position, Sismindari S published 10 articles. Che Man YB, Erwanto Y, Mustafa S and Zailani S have published as many as 9 articles. Then in the top 8-10 position with 8 articles published by Kamarulzaman NH, Khan Mi and Othman R.

Fig. 3 presents the top ten affiliated institutions in the field of halal products. The relevant institution is in Malaysia, which is Universiti Putra Malaysia, with 88 articles published. However, in the top ten affiliated institutions, there are links or research tendencies in Malaysia. Eight of them are institutions originating from Malaysia: Universiti Putra Malaysia, University of Malaya, Universiti Teknologi Mara, Universiti Kebangsaan Malaysia, International Islamic University Malaysia, Universiti Sains Malaysia, and Universiti Sains Islam Malaysia with an average number of articles above 20 publications. Two of them are Gadjah Mada University in Indonesia, with more than 30 articles.

Bradford's Law in Table 2 presents data by breaking the data into clusters based on sources often used in article creation. Sources in the core sources box are relevant or core journals used in research. The average source in the core sources occupies zone 1 (high impact factor). In Bradford's Law, journals are clustered into several zones. In zone 1, the entries are journals with quartiles 1-4 (Q1-Q4). The journal quartile is a reputable journal bending system based on the category of related

journal fields. The quartile indicates a journal's ranking; there are four quartile levels (Q): Q1, Q2, Q3 and Q4. The highest rate is in Q1, and the lowest is in Q4. In the Journal of Islamic Marketing, it is in zone 1 with Q2 and H-Index of 43. However, in zone 1 qualifications which are not affected by Q1-Q4, some core journals above the average journal quartile are Q1-Q4; this indicates that core sources journals are not linked to the journal quartile (Q) but rather to the research subject.

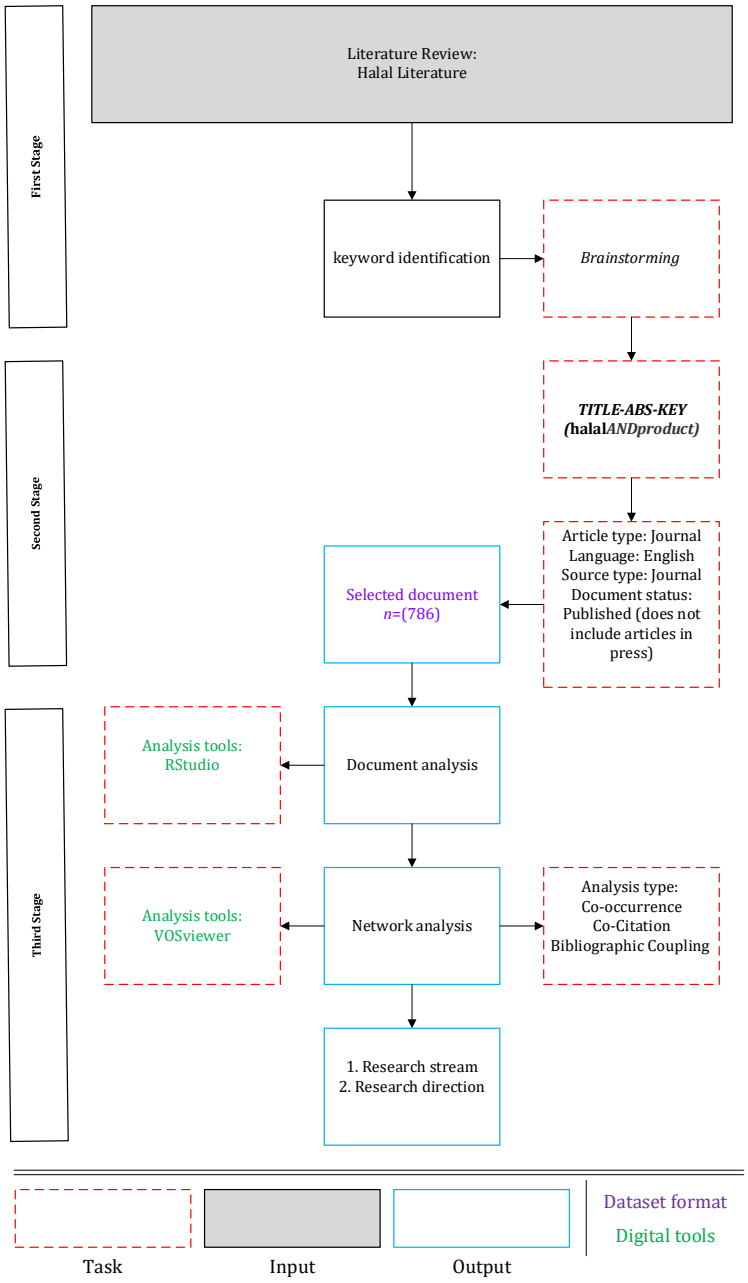

Fig. 1: Research approach

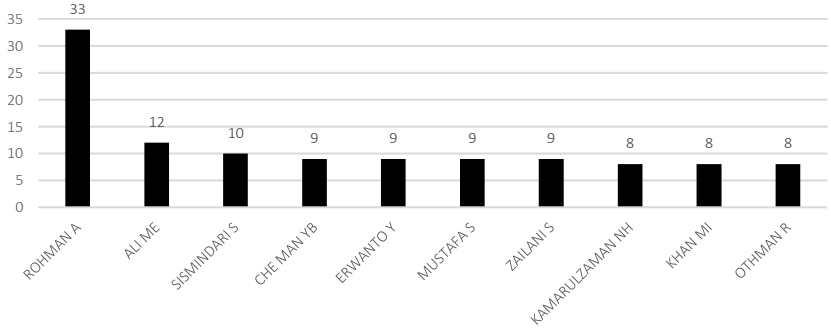

Fig. 2: Three perspectives of spirituality and performance

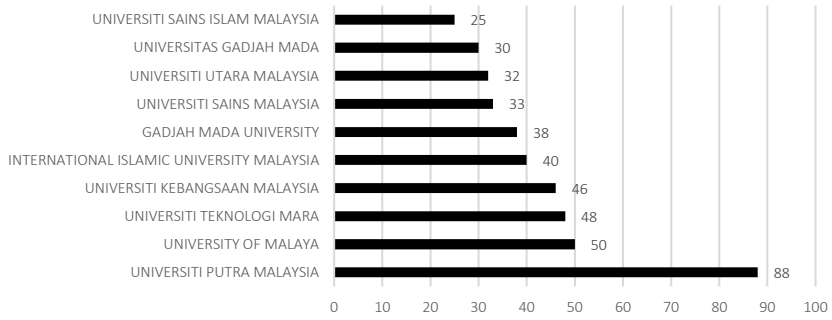

Fig. 3: Top ten most relevant affiliations

Table 2: Bradford's law

Sources	Rank	Frequency	Cumulative frequency	Zone
Journal of Islamic Marketing	1	118	118	Zone 1
International Journal of Supply Chain Management	2	33	151	Zone 1
International Food Research Journal	3	23	174	Zone 1
British Food Journal	4	17	191	Zone 1
Food Research	5	17	208	Zone 1
Malaysian Journal of Consumer and Family Economics	6	17	225	Zone 1
Advanced Science Letters	7	14	239	Zone 1
Meat Science	8	12	251	Zone 1
Global Journal Al-Thaqafah	9	11	262	Zone 1
Journal of Food Products Marketing	10	11	273	Zone 2

The picture below is the result of Scopus Analyze, which is processed independently using Microsoft Excel. The pattern of development of halal product research began in 1998 when the research carried out was relatively low until 2010. It experienced a slight increase in 2011. Research has increased significantly starting in 2016 until its peak in 2020 of 144 documents. However, from mid-2020 to 2022, there was a considerable decline in research.

Fig. 4 provides a clear visualization of the trends in document publication from 1998 to 2012. Initially, the trend starts off with very few documents in 1998, showing a gradual but consistent increase over the early years up to 2005, where the count of documents reached 37. This period indicates a slow growth, possibly reflecting burgeoning interest or the foundational phase of research in this field. From 2006 to 2010, there is a more noticeable increase, with the document count climbing steadily each year and reaching up to 83 by 2010. This suggests a strengthening interest and perhaps an expansion in research activities or resources dedicated to this field. The most striking part of the trend is observed in 2011, where there is a sharp spike, peaking at 144 documents. This dramatic rise could be attributed to specific catalysts such as significant advancements in the field, increased funding, or a surge in publication demand. However, this peak is followed by a substantial decline in 2012, where the number drops down to 65 documents. This sudden decrease could be due to a variety of factors, including shifts in research focus, a reduction in funding, or external influences impacting the research community.

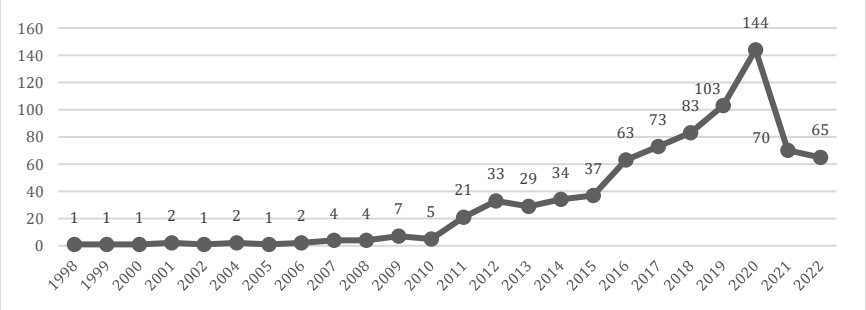

Fig. 4: Document by year

Excerpt analysis states the relationship between two documents (Alshater et al., 2022), where the document to be published must have a citation of another document. This section analyzes excerpts from documents, images, references, and authors. Table 3 discusses the top ten articles widely cited in the field of halal products; S Shah Alam is the most cited article by other authors, namely as many as 354 citations (29.50 citations per year). The average total citation of articles in the Top Ten Most Global Cited Documents is more than 100 articles. Table 4 explains the Top Ten Most Local and Global References where the Scopus database has citations are above 30 on average. However, the Global Citations do not race against how extensive the Local Citations of a document are, whereas, in the second-ranked document with Local Citations of 37 citations, it turns out that citations are more often done globally.

Table 3: Top ten most global cited documents

Reference	Citations
Shah Alam and Mohamed Sayuti (2011)	354
Lada et al. (2009)	298
Choi and Regenstein (2000)	243
Mukhtar and Butt (2012)	233
Asgar et al. (2010)	212
Rohman et al. (2011)	200
Aziz and Chok (2013)	196
Tieman (2011)	171
Derigs and Marzban (2008)	149
Olya and Al-Ansi (2018)	146

Table 4: Top ten most local and global references

Cited references	Local citations	Global citations
Bonne et al. (2007)	50	665
Shah Alam and Mohamed Sayuti (2011)	37	1188
Lada et al. (2009)	37	975
Wilson and Liu (2011)	36	625
Mukhtar and Butt (2012)	35	746
Ajzen (1991)	34	738
Rajagopal et al. (2011)	33	266
Alserhan (2010)	28	391
Tieman (2011)	34	615
Bonne and Verbeke (2008)	32	523

From Table 5, Rohman A has the highest H-Index with a number of 11 and total citations of 531. The other nine authors have an H-Index above an average of 6-9. However, the H-Index does not affect how often other authors cite the document or article. It is evident that Tieman M has an H-Index of 7 and a relatively large total citation among other authors, namely, 483 citations. Table 6 analyzes the Sources Impact on Halal Products. The Journal of Islamic Marketing is ranked first with an H Index of 26 and a total citation of 2,568. The British Food Journal occupied the second place with an H Index of 14 and a total citation of 649, then Meat Science as the third place with an H Index of 11 and 1,027 citations. Journals below it has an average H Index below eight and an average number of citations below 300.

3.2. Network analysis

At this stage, citation mapping was carried out for 786 articles on halal products using the bibliographic coupling technique in VOSviewer. VOSviewer can perform three bibliometric coupling analysis types: publications, journals, and authors (Alshater et al., 2022). Next, the database to be analyzed is assigned the unit of analysis into a document, and the method of analysis becomes fractional analysis during the analysis of bibliometric coupling (van Eck and Waltman, 2014). Fig. 5 shows the visualization of the bibliometric coupling.

Table 5: Author's impact

Author	H index	G index	M index	Total citations	Number of publications	Publication year start
Rohman A	11	22	0.917	531	29	2011
Ali Me	9	12	0.818	471	12	2012
Che Man YB	8	9	0.500	644	9	2007
Mustafa S	8	9	0.727	291	9	2012
Zailani S	8	9	0.571	259	9	2009
Ali A	6	7	1.200	132	7	2018
Haleem A	6	7	1.000	168	7	2017
Khan MI	6	8	1.000	184	8	2017
Sudjadi S	6	8	0.857	94	8	2016
Tieman M	6	7	0.500	483	7	2011

H index: the number of publications that is most cited by many documents, which some of them are cited with their documents; G index: top articles that together receive citations; M index: the number of H Index divided by the difference in years from the beginning of publication to the last year of publication

Table 6: Sources impact

Sources	H Index	G Index	M Index	Total citations	Number of publications	Publication year start
Journal of Islamic Marketing	26	46	2.000	2568	118	2010
British Food Journal	14	17	0.933	649	17	2008
Meat Science	11	12	0.611	1027	12	2005
Food Analytical Methods	7	8	0.583	195	8	2011
Food Control	7	9	0.438	298	9	2007
International Food Research Journal	7	16	0.538	287	23	2010
International Journal of Supply Chain Management	6	8	0.667	130	33	2014
Asian Social Science	5	6	0.500	73	6	2013
Food Chemistry	5	6	0.455	219	6	2012
Journal of Food Products Marketing	5	11	0.417	201	11	2011

The minimum citation count per document was set at 5, resulting in the selection of 363 documents out of an initial 786. The analysis identified 3 clusters, grouping 10 key authors. Fig. 5 shows cluster 1 in red, containing 5 documents; cluster 2 in green, with 3 documents; and cluster 3 in blue, with 2 documents. A review of each cluster reveals that clusters 1, 2, and 3, respectively, focus on topics such as halal products in Islamic marketing, halal food, inventory management, and decision management.

In Fig. 6, a co-citation analysis is conducted using fractional analysis, with a minimum of 10 citations per document. This approach identifies 61 items from a total of 29,590 reference citations across five clusters. The co-citation analysis demonstrates that each journal on halal products is interconnected with other authors, highlighting the strong network of shared citations in halal product research. The subsequent analysis employs the fractional calculation method to minimize the influence of individual documents across multiple authors. This method includes two analyses: first, co-authorship with the country as the unit of analysis; second, setting a minimum threshold of one document and one citation per country. These parameters result in the formation of 4 clusters, with 733 selected documents out of the original 786. Fig. 7 illustrates the co-authorship analysis based on country clusters.

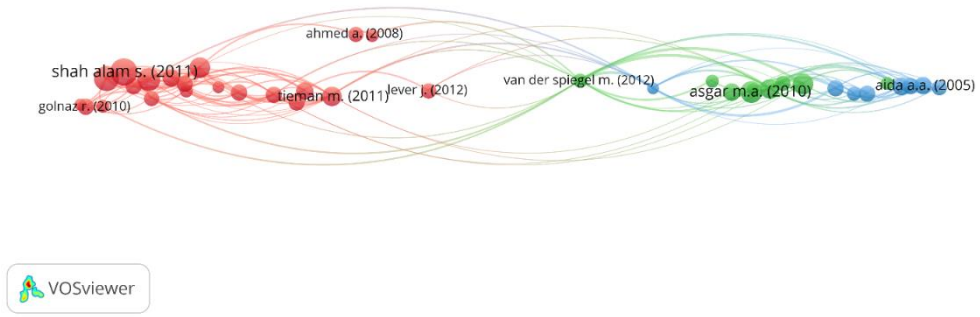

Fig. 5: Bibliometric coupling

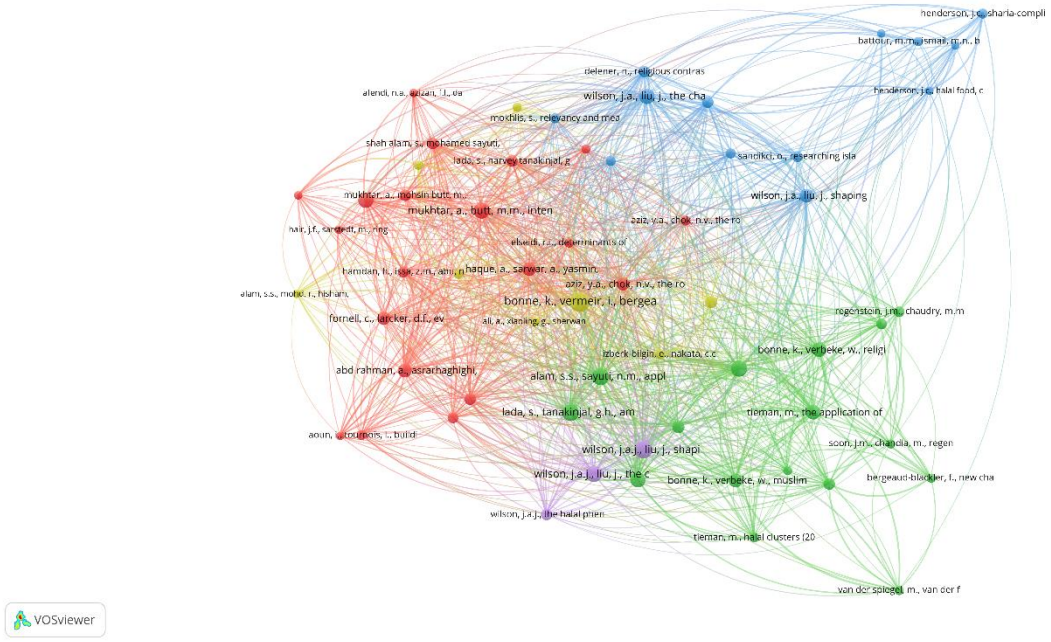

Fig. 6: Co-citations of journals

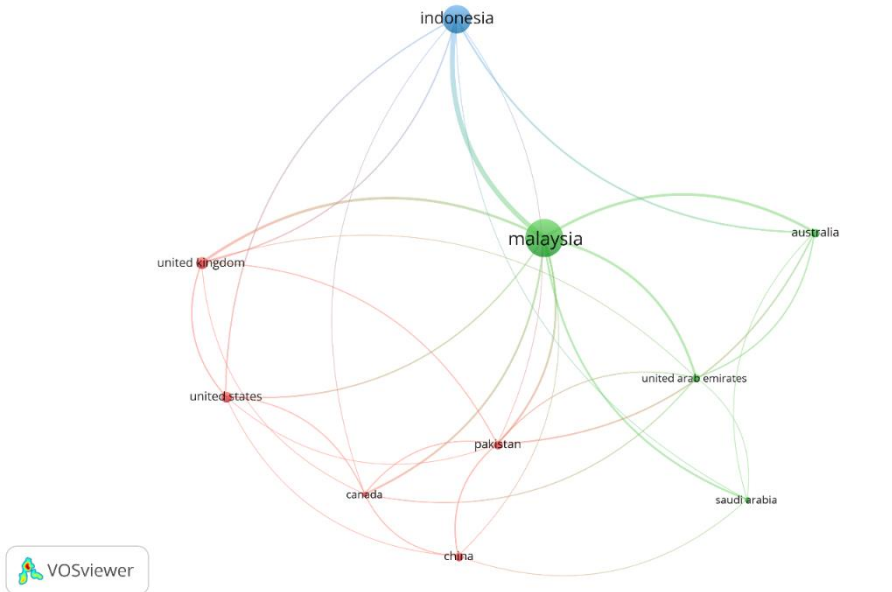

Fig. 7: Co-authorship by countries

When viewed from the Fig. 7, using the method of fractional analysis with the state as the unit of analysis, the country that most often co-authored is Malaysia.

It can be seen from Fig. 8 that Rohman A is the most relevant author in the field of halal products. Rohman A did much co-authoring with several other writers. There are 22 clusters with 260 items in them. However, some clusters have never co-authored with Rohman A, a relevant author in the field of halal products, so this can be an opportunity for journal publishing in the future.

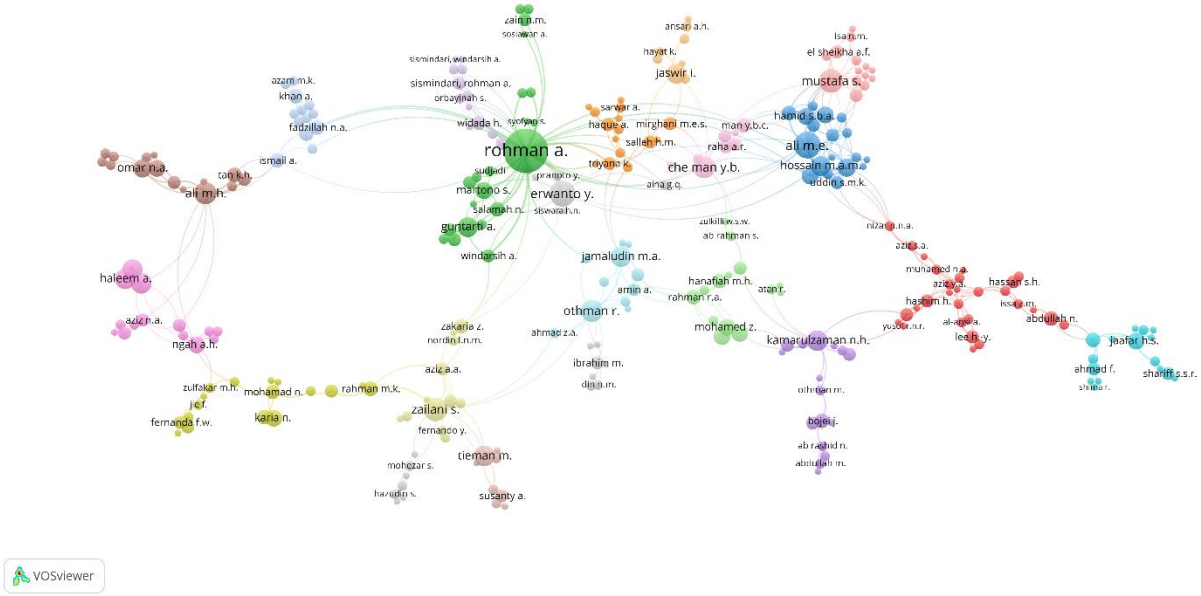

Fig. 8: Co-authorship by author

We used the co-occurrence analysis method with the all-keyword analysis unit and the full counting calculation method in this analysis. Then, the minimum number is set to 20 by issuing Article, Nonhuman, Islam, and Religion. Then, the minimum cluster size is set to 1. Researchers found two main clusters with a total number of 29 items. The cluster is represented in red and green. Fig. 9 shows keyword occurrence.

Keyword data is presented in two main clusters. In cluster 1, the dominant keyword is Field in Halal Products. It can be concluded that this cluster focuses on areas relevant to halal products. In the classification of cluster 1 keywords, it is not seen from the Total Link Strength but how dominant the keywords used by the authors in a study. Cluster 2 produces the main keyword, namely Halal Material Authentication, as shown in Table 7. It can be concluded that this cluster focuses more on the scope of halal product materials.

4. Content analysis and research agenda

The first research stream centers on halal products. Olya and Al-Ansi (2018) highlight findings in risk assessment related to halal products and services within the tourism industry, demonstrating varied risk interactions that align with complexity theory. However, a limitation of these studies is the reliance solely on empirical research without supporting case studies in specific contexts. Additional quantitative research is recommended to provide numerical validation of the findings.

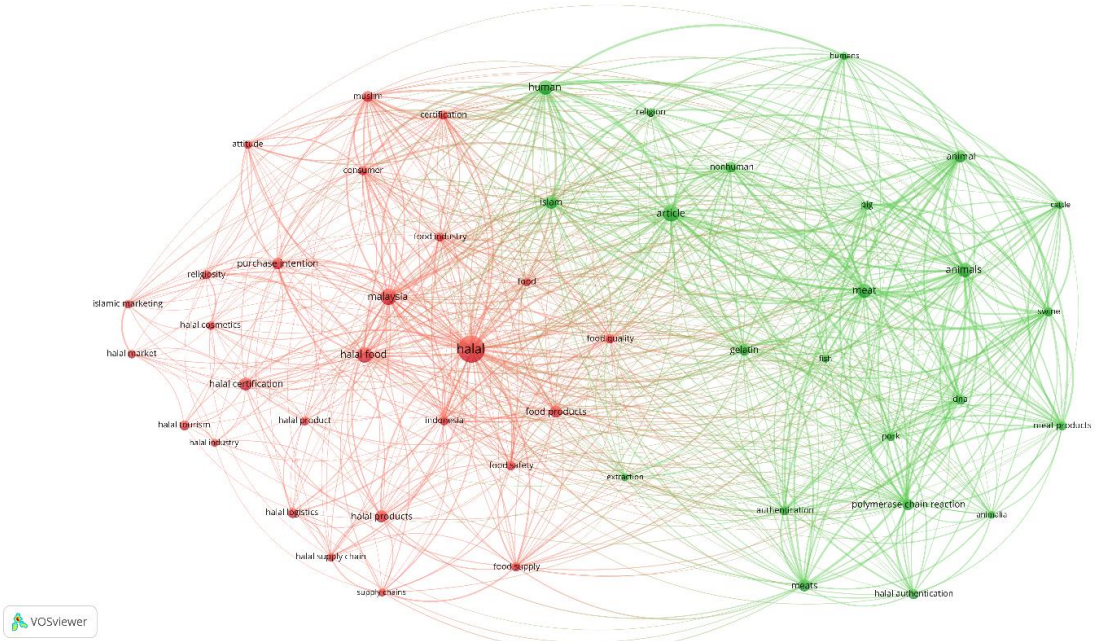

Fig. 9: Keyword occurrence

Table 7: Keyword and the number of occurrences, along with the link strength

No.	Keyword	Occurrences	Total link strength
Cluster 1:	Field in halal products		
1	Attitude	25	55
2	Certification	21	76
3	Consumer	23	91
4	Food industry	21	63
5	Halal	159	185
6	Halal certification	38	37
7	Halal cosmetics	23	20
8	Halal food	61	96
9	Halal market	24	11
10	Halal product	21	13
11	Halal products	22	25
12	Halal tourism	26	13
13	Human	46	216
14	Indonesia	21	63
15	Malaysia	63	124
16	Muslim	26	98
17	Purchase intention	40	48
18	Religiosity	29	29
Cluster 2:	Halal material authentication		
1	Animal	36	231
2	Animals	46	258
3	DNA	29	151
4	Gelatin	32	105
5	Halal authentication	28	51
6	Meat	46	223
7	Meat products	21	121
8	Meats	29	121
9	Pig	24	148
10	Polymerase chain reaction	37	170
11	Swine	28	195

Most authors conduct research on food with halal standardization, such as Asnawi et al. (2020), discussing the value of consumer perceptions and consumption of halal food. However, there are shortcomings in the research conducted by previous authors, such as the lack of understanding and explanation related to halal transactions that are important to the public. There are only a few authors who discuss halal transactions (Hayat et al., 2013) and discuss the cost of halal certification.

According to Al-Mazeedi et al. (2013), the halal marketing system needs to be emphasized using the logo or trademark symbol of the organization responsible for the halalness of the product. There are drawbacks, such as the absence of hands-on practice and real-world implementation.

There is an increasing trend of halal products among the public, specifically in the authentication of halal materials. Of course, authentication of halal materials is essential because the essential ingredients also influence the halalness of a product. For example, the source of the ingredients and details are generally displayed on the product label (Al-Mazeedi et al., 2013).

According to Anil (2012), slaughter is a significant problem currently, as Muslim societies are concerned about the conventional slaughter process. The disadvantage of this study is that there are no case studies with problems related to conventional slaughter, whether by religious standardization.

Research by Hassan et al. (2020) showed that the issue of the halal authenticity of a product has come to the attention of the Muslim community due to fraud and unknown sources of ingredients, and the author introduced a chemometric method using the Fuzzy Autocatalytic Set (FACS) to distinguish gelatin. However, there are shortcomings in this study; the standardization or classification of halal materials (gelatin) is not carried out, and no numerical data is listed. Complexity theory is needed to amplify the data.

5. Future direction

Several research deficiencies were identified from the processed database through a bibliometric literature review process. First, in cluster 1 of field research on halal products, most authors discuss the standardization of halal products. It is important to emphasize the practices from a study related to label standardization, halal marketing, tourism, the pharmaceutical industry, and food products. Overall, research is carried out only in qualitative form, but quantitative research with numerical data is needed to strengthen the research results. Second, the cluster is related to the authentication of halal materials, where the author discusses the material production process and the halalness of the source of the original material. However, the research carried out is only empirical and not types of research with case studies relevant to people's lives. Emphasis on the standardization of the halalness of a source of the material is also necessary, as well as the procedures for slaughtering or processing raw materials into finished materials.

6. Conclusion

Due to the development of the halal trend among Muslim-majority people, halal products have received considerable attention globally. Database processing on Scopus uses several tools to produce a map of the development of halal product research as

follows: 1) The top ten most relevant authors in the field of halal products are Rohman A, with 33 articles. 2) The top ten famous institutions in the field of halal products are found in Malaysia, namely Universiti Putra Malaysia. 3) The most relevant source in the field of halal products is the Journal of Islamic Marketing. 4) The author with the highest high index is Rohman A, and the source of the article with the highest high index is the Journal of Islamic Marketing. This research puts forward two relevant topics related to halal product research; these themes are 1) Fields in halal products and 2) Authentication of halal materials. There are shortcomings of previous authors in the research conducted, namely: 1) Lack of direct or practical application in the trend of halal products, 2) Lack of research in the scope of production or the process of making halal food, 3) There has been no significant research on halal transactions, 4) Research has only been carried out within the scope of Southeast Asia, 5) There is no quantitative research.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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