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A Bibliometric Analysis of Halal Food and Certification: Existing Research & Future Directions

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ABSTRACT

Purpose: Present paper makes an attempt to offer a systematic analysis of researches conducted on an emerging area of 'halal food' and 'certification' across the globe during the period of 2013-2020.

Design/methodology/approach: Along with extensive review of relevant literature on halal food and certification in a period of eight years, present study offers a bibliometric analysis on a sample of 205 scholarly research articles published on the subject. The data retrieved from Scopus database has been put to the analysis with the help of Biblioshiny (R Package).

Findings: The emerging concept of 'halal food' and 'halal certification' offers a great opportunity for researchers to explore, analyze and recommend the appropriate marketing strategies to be opted in different countries and regions. Present research has identified the research gaps as possible areas of further research that may significantly contribute to the body of knowledge on 'halal food' and 'halal certification'.

Research Limitations/Implications: Although present study attempts to systematically review the existing research (s) conducted on halal food and offers directions for future research but the analysis is based on research papers retrieved from Scopus repository only. The same may further be performed on the database of other repositories or use mixed method analysis.

Originality/Value: Present study offers a way forward to research on 'halal food' in a systematic manner with a combination of citation analysis of Document, Sources, Authors, Affiliations, Countries and three-fold analysis of Title, Keyword and keyword plus to identify the most cited papers and their dimension of research.

Introduction

The term 'halal' in its simplest form may be defined as compliance with the principles of Islam. There are some do's and don'ts prescribed in Shariah demanding believers to follow them as commandments. What is allowed in Shariah, is termed as 'Halal' and that which are not allowed are termed as 'haram' or restricted ones. Long established notion about the word 'halal' restricts itself to the area of products particularly food items which do not use alcohol, pork etc. Additionally, for food items in general and meat to be specific, it is said that the established way of slaughtering the animals as per the ritual is a prerequisite. Although, exactly this is not all, halal means. For differentiating the two words 'halal' and 'Jhatka' that are used in case of meat, it is said that when an animal is slaughtered by a single strike of a weapon, the meat is named as 'meat after Jhatka' and is prohibited as per Islam. The Quran commands Muslims to consume halal food and avoid haram ones.

For Non-Muslim population, the term halal indicates towards a food item which is permitted to Muslims. It is said that the halal principle for food items is clearly defined in the verses 2:168, 2:172, and 2:173 of Quran. (Islamic Foundation).

Amidst evolving global dimensions of food industry, 'halal' food has emerged as one of the rampantly growing industries (Iranmanesh et al., 2019). Keeping in mind the emergence and magnitude of halal certified products across the segments especially food market, present paper makes an attempt to offer a systematic literature review of 'halal food' in global halal market.

Research Flow

Present Study performs bibliometric analysis on the database of 205 documents extracted from the repository of Scopus. The plan of present research may be understood from the fig 1.

Results and Description of Documents used for Research

The results of analysis reflect that during a total period of 8 years (2013-2020) a total of 205 documents could be retrieved from 106 sources giving a count of 3.43 as average number of publications. Average citations per annum were found to be 1.916 whereas average citations per documents stood at an impressive number of 9.551 per document. With 561 keywords Plus and only 28 documents found to be single authored, collaboration index of 3.12 ratifies the high degree of collaboration in research publications on halal food.

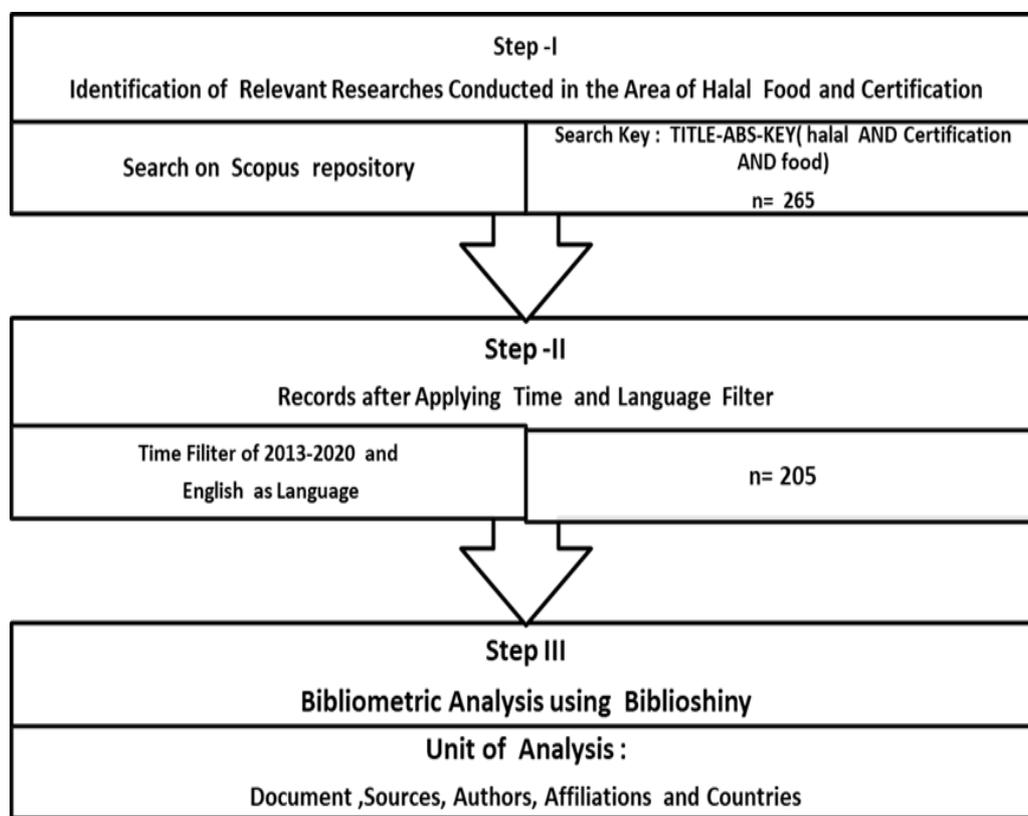


Fig 1: Flow of research

Three field plot identified 'halal' 'food' 'review' 'Muslim' 'certification' and 'consumers' to be the topmost titles followed by 'halal certification', 'halal', 'halal food' 'Malaysia' as prominent keywords and 'certification', 'Islam', 'food quality', 'human', 'food handling' and 'animal welfare as keyword plus.

Source Analysis

The Process of identifying the most relevant sources publishing articles on 'halal food' identified Journal of Islamic Marketing as a leading journal with the highest number of 25 articles followed by British Food Journal -13, International Journal of Supply Chain Management-13 and Malaysian Journal of Consumer and Family economics publishing 6 articles during the period. This ratifies the concentration of research publications in selected journals. (Table 2 & Figure 3).

Listing of Journal's as Per Bradford's Law: Bradford's law talks about the estimation of exponentially diminishing returns of search for references in the journals of sciences.

Journal of Islamic Marketing, British Food Journal, International Journal of Supply Chain Management, Malaysian Journal of Consumer and Family Economics, The Routledge handbook of halal hospitality & Islamic Tourism and International food research journal were found in zone 1 which approves the highest productivity of these sources (Fig 4).

Most Productive Authors

Most productive authors have been identified on the basis of citations of their respective research papers. Fractionalized authorship quantifies the contribution of an individual author to a published set of papers. Ali MH, Regenstein JM both had produced 5 papers but fractionalization value in case of former came to be 1.23 whereas it is 2.92 for the later flowed by AB Talib MS having 4 Articles with 2.08 of fractionalized value (Table 3).

Most Relevant Affiliations:

The affiliation is evaluated for its productivity on the basis of number of articles published by it. The process of identifying the most relevant affiliation on the basis of its productivity reflects Universiti Teknologi Malaysia as the most productive institution with a total number of 31 articles followed by Universiti Kebangsaan Malaysia (23), Universiti Putra Malaysia (21), Chulalongkorn University (20), University of Malaya (19) respectively. (Table 4).

Analysis of Conceptual Structure:

in nature but the scopes of research on such

Thematic Map

For the purpose of identifying significant themes of research conducted in the area of halal food, analysis of conceptual structure was performed to generate thematic map. Thematic map is a diagrammatic representation of identified themes of research classifying them into different segments.

Figure V shows the thematic map generated from the bibliometric analysis. On X-axis the centrality of the themes indicating the significance of theme has been shown whereas on Y-axis density that examines the development of selected themes has been plotted. This map classifies the entire diagram in four parts. These four parts on the basis of their respective relevance –density proposition is named as Niche themes, Motor Themes, Emerging themes and Basic Themes.

The first quadrant of the thematic map presents proposition of high density-low centrality which is classified as a segment indicating 'Niche themes'. Niche themes are highly developed themes but remain isolated hence termed as niche themes. In this part the themes like discriminant analysis, mass spectrometry and gas chromatography are found which of course are the technical one having higher degree of development but remain isolated owing to low level of centrality.

The second quadrant of thematic map lists Motor themes presenting combination of high-density –high centrality of themes. They support consolidation and development of the specific field of knowledge owing to their high level of density and centrality. Motor themes are essential and developed ones. In these segment themes like Commerce, Food packaging, consumer behavior, food quality, Islam and Animals are observed. Some other topics like religion, food analysis and food contamination were observed at the border line indicating their presence in Motor as well as Niche themes.

Third segment of the map is named as emerging or declining themes. They are termed as emerging or declining reflecting the very nature of such themes which emerge to be a good one or decline. Under this segment large number of themes like halal, food supply, surveys, halal certification, food safety, certification process and mass spectrometry are found. This part of the map indicates the emerging dimensions of research in the field of halal food.

Basic themes of the relevant topic are listed in the last quadrant of the thematic map. It comprises of themes which are very much basic themes are very wide. These themes are

significant for the research field but are yet to develop. This part of map presents high

centrality- low density proposition. (Fig 5)

Description	Results
Main information about Data	
Timespan	2013:2020
Sources (Journals, Books, etc.)	106
Documents	205
Average years from publication	3.43
Average citations per documents	9.551
Average citations per year per doc	1.916
Document Contents	
Keywords Plus (ID)	561
Author's Keywords (DE)	575
Authors	
Authors	578
Author Appearances	674
Authors of single-authored documents	26
Authors of multi-authored documents	552
Authors Collaboration	
Single-authored documents	28
Documents per Author	0.355
Authors per Document	2.82
Co-Authors per Documents	3.29
Collaboration Index	3.12

Table 1: Key Information with Results
Source: Authors' Compilation

Authors	Articles	Articles Fractionalized
ALI MH	5	1.23
REGENSTEIN JM	5	2.92
AB TALIB MS	4	2.08
ZAILANI S	4	0.95
AI CHIN T	3	1.08
ALAM SS	3	0.70
ARIF S	3	1.17
ARSAT A	3	0.95
FUSEINI A	3	1.58
IRANMANESH M	3	0.75

Table 2: Most Relevant Authors
Source: Generated from Analysis by Authors

Affiliations	Articles
UNIVERSITI TEKNOLOGI MALAYSIA	31
UNIVERSITI KEBANGSAAN MALAYSIA	23
UNIVERSITI PUTRA MALAYSIA	21
CHULALONGKORN UNIVERSITY	20
UNIVERSITY OF MALAYA	19

Affiliations	Articles
UNIVERSITI UTARA MALAYSIA	18
UNIVERSITI TEKNOLOGI MARA	16
UNIVERSITI SAINS MALAYSIA	11
UNIVERSITI MALAYSIA SABAH	9
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA	8
UNIVERSITY OF KARACHI	7
FACULTY OF HOTEL AND TOURISM MANAGEMENT	6
IQRA UNIVERSITY	6
JALAN GOMBAK	6
UNIVERSITY OF BRISTOL	6
UNIVERSITY OF CENTRAL LANCASHIRE	6
CORNELL UNIVERSITY	5
INSTITUT TEKNOLOGI SEPULUH NOPEMBER	5
THE STATE POLYTECHNIC OF BANDUNG	5
UNIVERSITAS PADJADJARAN	5

Table 3: Most Relevant Affiliation
Source: Generated from Analysis by Authors

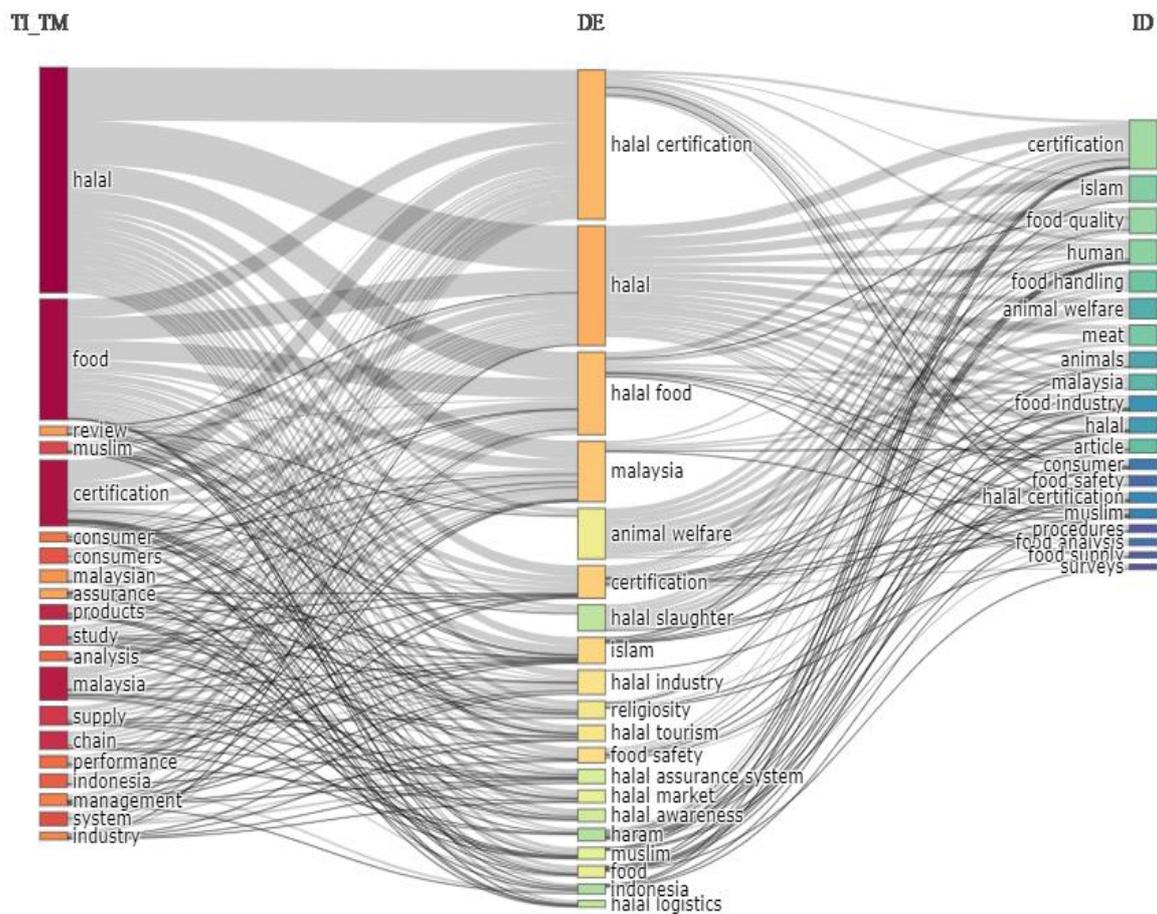
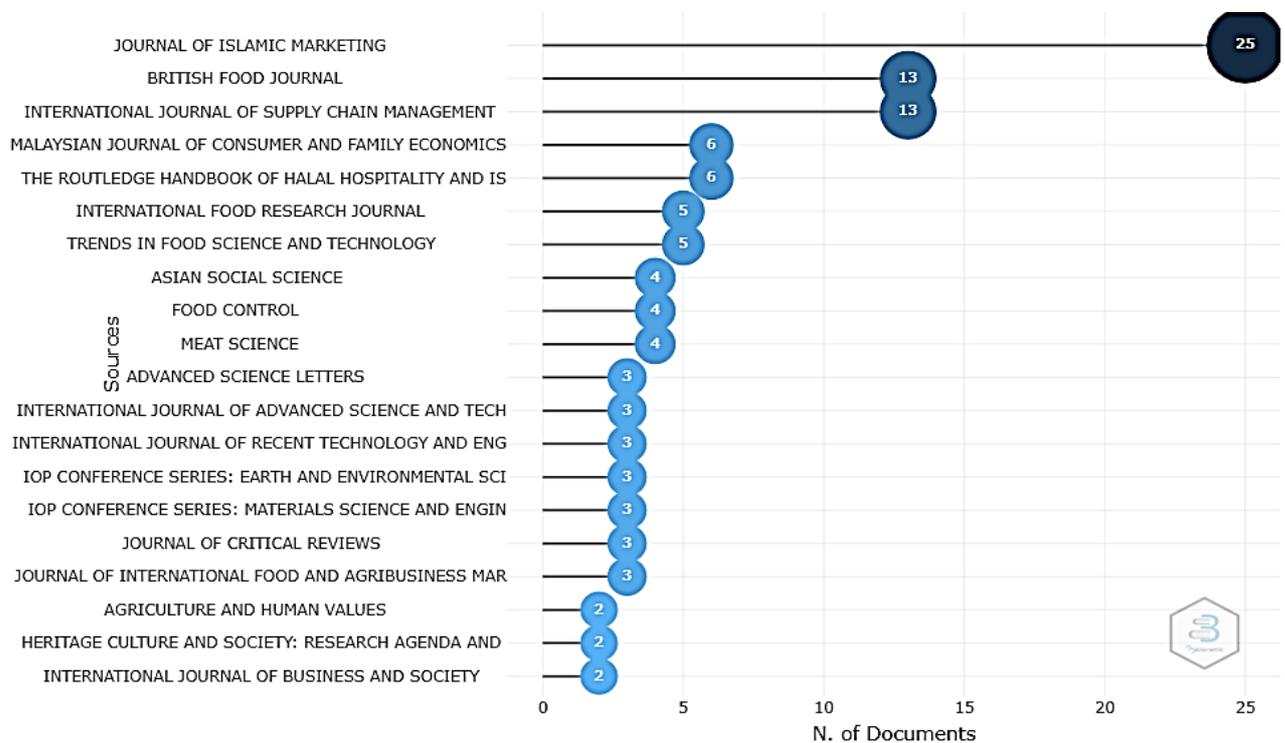


Fig 2: Three-Field Plotec
Source: Authors' Compilation

Sources	Articles
JOURNAL OF ISLAMIC MARKETING	25
BRITISH FOOD JOURNAL	13
INTERNATIONAL JOURNAL OF SUPPLY CHAIN MANAGEMENT	13
MALAYSIAN JOURNAL OF CONSUMER AND FAMILY ECONOMICS	6
THE ROUTLEDGE HANDBOOK OF HALAL HOSPITALITY AND ISLAMIC TOURISM	6
INTERNATIONAL FOOD RESEARCH JOURNAL	5
TRENDS IN FOOD SCIENCE AND TECHNOLOGY	5
ASIAN SOCIAL SCIENCE	4
FOOD CONTROL	4
MEAT SCIENCE	4

**Table 4: Most Relevant Sources
Generated from Analysis by Authors**



**Fig 3: Sources of relevant studies
Source: Authors' Compilation**

Thematic Evolution:

In order to generate the thematic evolution map parameters considered were Keywords Plus – No of Words- 250, Minimum Cluster Frequency Per Thousand Docs-5 and Weight Index -2013-18 and 2019-20. Thematic evolution map shows certification, halal, Islam, food supply and halal certification to be the prominent themes of study during 2013-18. In 2019-20 it progressed to food industry, meats, certification, food supply, surveys and food quality. A close look at thematic evolution shows the advancement of research from introductory to factual, evidence/survey-based studies ratifying the advancement on both the dimensions viz; advancement of themes and research methodologies. (Figure-VI, Table-V).

Table-V shows highest number of occurrences of 18 for the theme ‘certification’ from 2013-18 to 2019-20 having words like Certification; human; Malaysia; article; Muslim; catering service; consumer attitude; practice guideline. The Weighted inclusion index for this theme was 0.65 and for food industry it was 1.0 along with number of occurrences to be 6 followed by consumers (3), Indonesia (2), Meat (4) and halal certification (6).

Word Cloud:

For identification of frequently used word on the topic, word cloud was generated. For this purpose, parameters viz; ‘title’ and ‘abstracts’ ‘Author’s Keywords’ and ‘keyword Plus’,

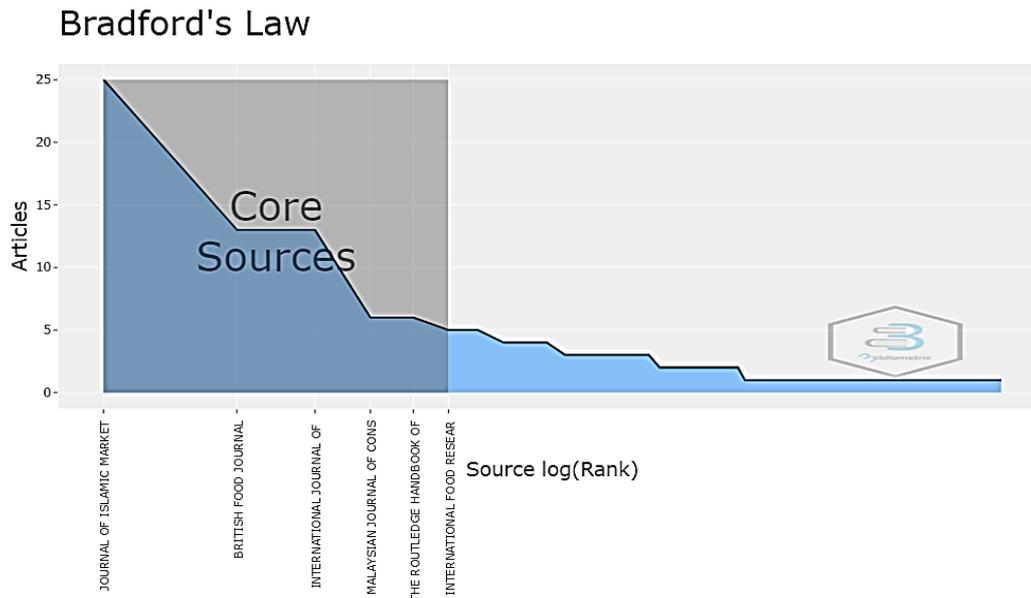


Fig 4: Bradford’s Law
Source: Authors’ Compilation

Certification emerged as the most significant word followed by food quality, meat, human, food handling, animal welfare, food safety, halal, food analysis and food industry. (Figure-VII).

Citation Overview of Highly Cited documents:

With a view to identify the extensively worked domain (s) of halal food from existing literature, authors chose top ten articles from Scopus database in the order of their citation. (Table-VI). It provided documents ranging from researches on ‘halal awareness’, ‘halal food’, ‘halal certification’ ‘halal tourism’, ‘halal integrity in food supply chain’, drivers of buying behavior in relation to halal food and innovations in halal food industry to name a few. A review of the studies of top ten highest cited papers are summarized as below to identify the composition and direction of researches conducted on halal food in the recent past.

The fastest growing nature of global halal industry demands for reliable and efficient screening method that can ensure the alignment of food products with halal principles. Numerous studies have identified the role of trusted technology and innovation in halal food analysis. (Lubis et al., 2016).

The commercial volume and value of halal food have significantly been increasing across the globe. The basis of harmonizing the religious and secular need for protecting animal welfare at slaughter have extensively been discussed and enabled surprising advances in related technologies. (Farouk, 2013).

Dearth of empirical examination of significant

role of halal awareness, certification and marketing related components in influencing purchase intention of buyers offered abundant scope of research in this area. As one of the most cited and maiden attempt, this study offered a conceptual model on halal purchase intentions based on empirical testing. (Aziz & Chok, 2013).

While purchasing processed food items, Muslim consumers are skeptical about the genuineness of products vis-à-vis halal products. Out of different factors influencing buying decision of processed food by Muslim consumers, ‘knowledge’ about the processed food emerged as the most influential factor. (Hamdan et al., 2013)

On the question of willingness of consumers to pay for halal labeled meat, very interesting cross-sectional research conducted in Belgium in the year 2013 established comparatively higher preference of female consumers towards the certified products at supermarkets. Additionally, gender and generation of Muslim consumers emerged as a determining factor for actual premium payment at the Islamic butcher shop. (Verbeke et al., 2013).

The role of halal food in promoting the tourism of a country has also been observed as one of emerging dimension of research on halal food and certification. (Henderson, 2016).

When it comes to halal certification, integrity have always been a debatable issue. Understanding the various stages and critical consciousness for halal integrity within the food chain is a prerequisite to cater to the consistently growing Muslim consumers’

market. Halal integrity has emerged as a catalyst to the success of emerging halal food market. (Soon et al., 2017). Researches have proposed systematic supply chain integrity frameworks for halal food and they have also been regarded as a contribution to the newly developed supply chain integrity framework in

halal food industry. (Ali et al., 2017).

Analysis of challenges and opportunities in adopting halal logistics is another dimension of research in the domain of halal. In this segment a focus group-based study conducted in Malaysia with regard to halal logistic services

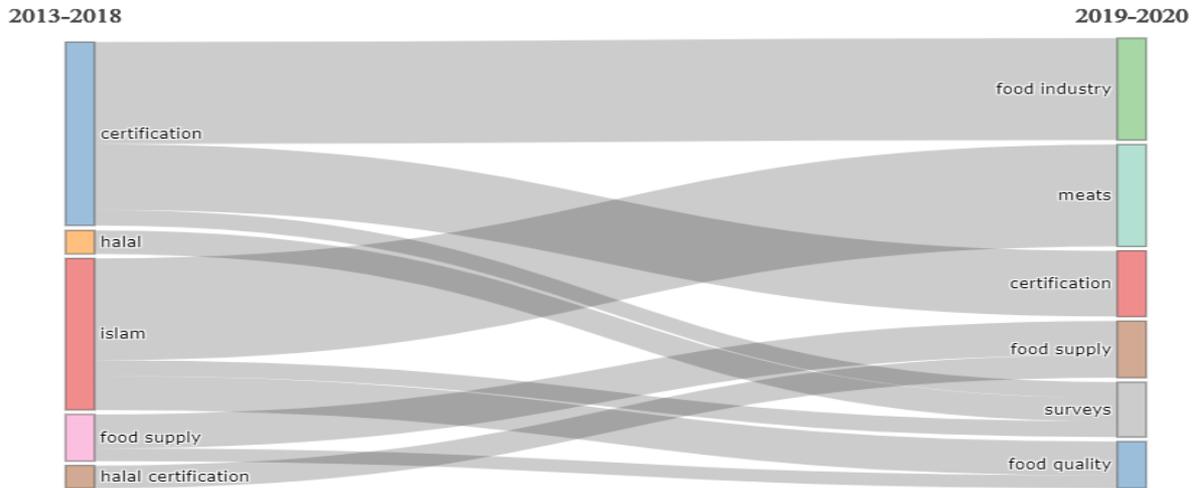


Figure 5: Thematic Evolution
Source: Authors' Compilation

From	To	Words	Weighted Inclusion Index	Inclusion Index	Occurrences	Stability Index
certification--2013-2018	certification--2019-2020	Certification; human; Malaysia; article; Muslim; catering service; consumer attitude; practice guideline.	0.65	0.07	18	0.02
certification--2013-2018	food industry--2019-2020	food industry	1.00	1.00	6	0.04
certification--2013-2018	surveys--2019-2020	Consumer	0.15	0.17	3	0.03
food supply--2013-2018	food quality--2019-2020	Indonesia	0.13	0.17	2	0.07
food supply--2013-2018	food supply--2019-2020	food supply	0.33	0.25	4	0.11
halal--2013-2018	surveys--2019-2020	Surveys	0.23	0.17	4	0.08
halal certification--2013-2018	food supply--2019-2020	halal certification	0.22	0.25	6	0.08
islam--2013-2018	food quality--2019-	food quality; animals; animal	0.33	0.10	6	0.03

From	To	Words	Weighted Inclusion Index	Inclusion Index	Occurrences	Stability Index
	2020					
islam--2013-2018	meats--2019-2020	Meats	1.00	1.00	4	0.05
islam--2013-2018	surveys--2019-2020	supply chains	0.15	0.17	2	0.04

Table 5: Thematic Evolution
Generated from Analysis by Authors

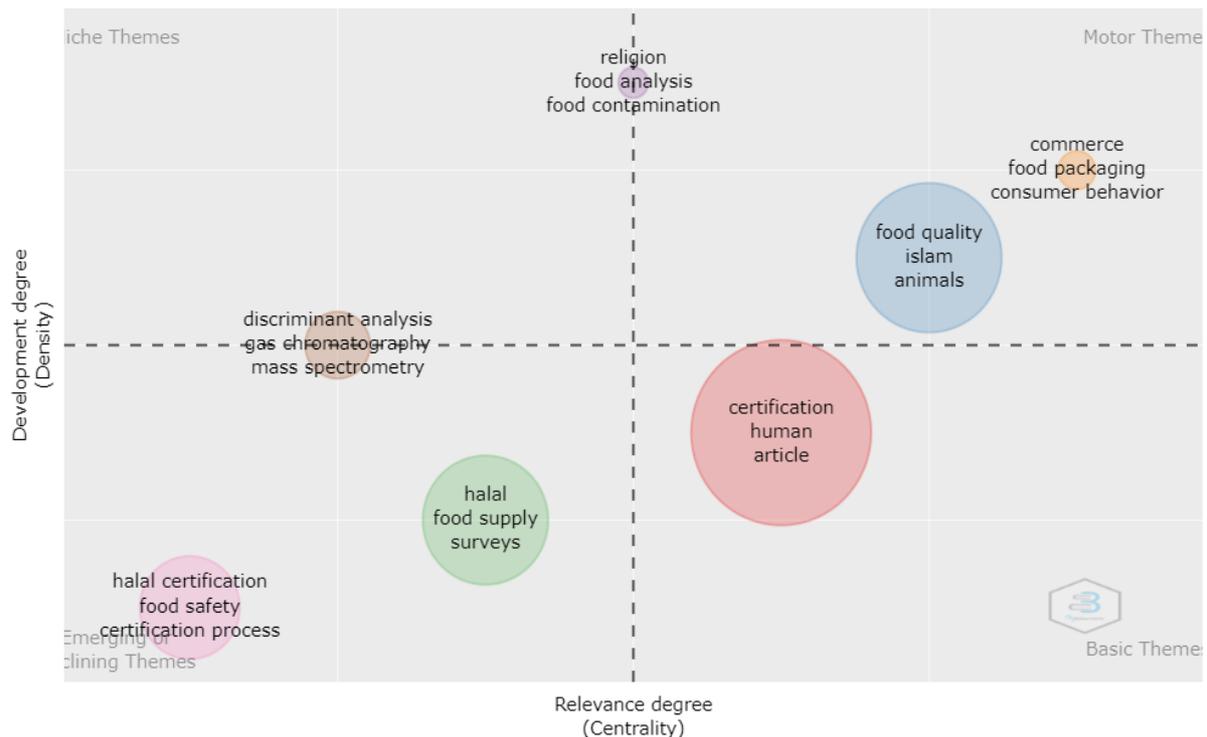


Fig 6: Major Themes
Source: Authors' Compilation

have systematically identified the opportunities and challenges. (Zailani et al., 2017).

Emergence of halal logistics demands for additional cost to be incurred on account of infrastructure development for it. Drivers that motivate consumers to pay for halal logistics in Malaysian perspective and its impact on their demand have been empirically examined. It shows that despite the significant role of halal logistics in supporting the halal status of a given halal food the demand of such service was skimpy. (Fathi et al., 2016).

Discussion

The systematic analysis of relevant literature had identified the directions for further research on halal food. Although the detailed analysis of relevant literature had identified most relevant source (s), Authors, Affiliation,

word cloud, thematic map and evolution of themes but for a better understanding of further scope of research point-wise discussion have been provided as follows:

- The Evolution map indicates the transformation of topics from the basic themes like certification, halal, Islam, food supply and halal certification to advanced and macro environmental topics like food industry, meats, certification, food supply, surveys and food quality. This trend reflects the dearth of research focusing at micro-level.
- Model-based studies with the use of quantitative techniques and methods have gained prominence in the recent times. Existing theories have not been developed from the very perspective of 'halal'. Nevertheless, majority of the studies undertaken on halal food are

Year	Document Title	Authors	Journal Title	No. of Citations
2013	The Role of Halal Awareness, Halal Certification, and Marketing Components in Determining Halal Purchase Intention Among Non-Muslims in Malaysia: A Structural Equation Modeling Approach	Aziz Y.A., Chok N.V.	Journal of International Food and Agribusiness Marketing	163
2013	Credence quality coordination and consumers' willingness-to-pay for certified halal labelled meat	Verbeke W., Rutsaert P., Bonne K., Vermeir I.	Meat Science	74
2016	Halal food, certification and halal tourism: Insights from Malaysia and Singapore	Henderson J.C.	Tourism Management Perspectives	70
2017	Halal integrity in the food supply chain	Soon J.M., Chandia M., Regenstein J.M.	British Food Journal	64
2013	Advances in the industrial production of halal and kosher red meat	Farouk M.M.	Meat Science	60
2017	A supply chain integrity framework for halal food	Ali M.H., Tan K.H., Ismail M.D.	British Food Journal	57
2017	Halal logistics opportunities and challenges	Zailani S., Iranmanesh M., Aziz A.A., Kanapathy K.	Journal of Islamic Marketing	53
2016	Drivers of consumers' willingness to pay for halal logistics	Fathi E., Zailani S., Iranmanesh M., Kanapathy K.	British Food Journal	48
2016	From market to food plate: Current trusted technology and innovations in halal food analysis	Lubis H.N., Mohd-Naim N.F., Alizul N.N., Ahmed M.U.	Trends in Food Science and Technology	42
2013	Purchasing Decisions among Muslim Consumers of Processed Halal Food Products	Hamdan H., Issa Z.M., Abu N., Jusoff K.	Journal of Food Products Marketing	40

Table 6: Citation Overview of Top 10 Documents Generated from Analysis by Authors

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