COVID-19 and the Role of Halal Food

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Abstract—This study aims to determine the map of the development of research on the halal food industry's theme in the COVID-19 pandemic published by indexed journals. The study was conducted in August 2020. The analysis focused on the trends of the topics, keywords, authors and journals. The data analyzed were more than 50 digital object identifier equipped papers. The object of the study is a published journal from 2019 to 2020. The data is then processed and analyzed using the VOSviewer application program to determine the bibliometric mapping of the development of COVID-19 research and the role of halal food. The results showed that the number of articles discussing the theme of halal food has been quite large in the last two years. Bibliometric visualization shows that the map of the development of COVID-19 research is divided into 4 clusters. Cluster 1 consists of 12 topics, cluster 2 consists of 12 topics, cluster 3 consists of 8 topics, and cluster 4 consists of 8 topics. This study's findings are that there is special attention to the halal industry's development, mostly halal food, to mitigate the prolonged health crisis's impact. This study provides an overview of trends in the most popular topics, keywords, journals and authors in articles on halal food, thus providing information for researchers focused on research in the field of halal food. In the end, this theme has the potential to continue to be developed

Keywords- COVID-19, Halal Food, Bibliometric

I. INTRODUCTION

The whole world is currently experiencing a prolonged crisis due to the COVID-19 pandemic since the beginning of 2020. The virus, which first originated from China, has resulted in severe economic damage [1]. Inflation experienced by Indonesia in March 2020 was recorded at 0.10% (month to month) and 2.96% (year on year). This pandemic impacts the exchange rate of various countries' currencies against the US dollar and the problem of meeting the availability of food materials and other supporting commodities properly [2].

The COVID-19 pandemic period shows enormous urgency in needing a hygienic food supply, especially halal food [3]. This is because the cause of the COVID-19 pandemic is the problem of food that has not been paid attention to its health, so that the rules applied by Islam in the recommendations for choosing food are fundamental to pay more attention to [4]. Epidemiological studies conducted on primary COVID-19 cases showed that the cases that occurred were exposed to the food market in Huanan, Wuhan. This food market is known to provide food from animals that are not halal for consumption. Another study also states that Halal food consumption in a sustainable manner can reduce the risk of a pandemic such as COVID-19 in the future [5].

COVID-19 has also caused the demand for halal food consumption to increase, so that food needs to be considered so that what goes into a Muslim's stomach is food that is truly guaranteed to be halal so that it produces good energy and is protected from various diseases [6]. The issue of food security is also one of the government's challenges during this pandemic, how to adequately meet the people's food needs[7].

More than 50 scientific research papers were published by various journals, both national and international, in the early 2020 observation period until the time this paper was written, August 2020, which discusses COVID-19 and the role of halal food. Paper with this theme is interesting to discuss considering the importance of scientific research to be carried out to generate ideas and innovations that can answer the country's economic problems.

The rapid development of halal food research is interesting to research in bibliometric analysis in line with the development of demand for halal food worldwide. This research aims to analyze the mapping of bibliometric characteristics of the development of trend topics, authors, keywords, authors and journals in papers on halal food published until August 2020.

This research is structured as follows—the second part reviews, in general, the research method, namely the bibliometric method. The third section presents and reports the results of descriptive research while providing content analysis of each cluster category in a meta-analysis consisting of the number of published papers on the theme of COVID-19 and the role of halal food, the methodological approach used, research topics, top authors, top institutions and countries as top objects of study. Then explain bibliometric mapping
visualization starting from keyword trends, authors to journals that publish COVID-19 theme papers, and the role of halal food. The Fourth part is the closing of the paper, which contains a summary of the main discussion and conclusions.

II. LITERATURE REVIEW

The halal industry, especially halal food, is becoming a new and popular topic of conversation in the world business, both in Indonesia and in other countries. Even the value of halal products currently traded is around the US $ 254 billion [8]. The halal industry concept was born from Islam's concept as a religion that is a blessing for all nature (Rahmatan Lil Alamin), where Islam regulates all aspects of human life, not only about worship but also about worship also all aspects of life.

The word halal comes from Arabic, which means permissible, justifed and welcome to be consumed according to Islamic law rules, while tayyib means quality and does not endanger health. All types of products, especially food and beverages, are lawful except for some of the argument's prohibitions [9]. If it is related to industrial products, halal can be interpreted as products that are allowed to be consumed by a Muslim [10].

The obligation to consume halal products is stated in the Holy Qur'an Surah Al-Maidah verse 88, which shows an explicit command to consume halal food. In Islam, foods that are considered dangerous for consumption are prohibited are pork, blood, alcohol, carcasses that are slaughtered by names other than Allah, which have been regulated by Sharia. This shows that Halal is a religious term related to Islam, where the rules regarding Halal are contained in Al-Quran and Sunnah's arguments and have become part of the Islamic tradition.

Globally, the market for halal-certified food and products is increasing rapidly. Halal products have received worldwide recognition as a scale for food safety and quality assurance. Besides, the halal concept includes requirements underSharia, including aspects of Islam, aspects of hygiene, sanitation and safety [11].

Halal products' need continues to increase every year, especially in the halal food industry for the Muslim community's primary needs[12]. The belief that halal food is healthier, safer and tastier is what Muslims and non-Muslim consumers consume halal food [13]. Also, the Muslim community's awareness, especially in the role of market consumers to carry out their religious obligations, is a factor that increases the demand for halal food, so it gets excellent attention in the global market [14].

III. METHODOLOGY

Bibliometric mapping is an important research topic in the bibliometric field [15]. Two different bibliometric aspects are the construction of the bibliometric map and the graphical representation of the map. In the bibliometric literature, the most significant concern is in the construction of the bibliometric map. Research of bibliometric related to the effects of differences in similarity measures [16, 17, 18]and tested with different mapping techniques [19, 20, 21]. The graphic representation of the bibliometric map has received less attention. Although some researchers seriously study issues related to graphical representations [22, 23, 24], most articles published in the bibliometric literature rely on simple graphical representations provided by computer programs such as SPSS and Pajek.

This study uses paper publication data sourced from various journals with research on COVID-19 and the role of halal food. Data collection through tracing papers within the last year. From the search results, there were 52 published articles. Data in the form of the number of published papers on the theme of COVID-19 and the role of halal food, methodological approaches, research topics, top authors, top institutions that contributed to publishing published articles were analyzed using Microsoft Excel 2010. As for the development trend of COVID-19 theme publications and industrial issues, Halal food was analyzed using VOSviewer software. VOS determines the location of items on the map by minimizing:

$$V(x_i, ..., x_n) = \sum_{i<j} s_{ij} \|x_i - x_j\|^2$$ (a)

become:

$$\frac{2}{n(n-1)} \sum_{i<j} \|x_i - x_j\| = 1$$ (b)

Therefore, VOS's idea is to minimize the number of weights of the square of the distance between all pairs of items. The similarities between the weight of the items the square of the distance between pairs of items. To avoid worthless solutions, restrictions are imposed so that the average distance between two items must be equal to one.

IV. COVID-19 AND THE ROLE OF HALAL FOOD

A. Meta-Analysis

There were 52 papers published in the observation period of the last year. The distribution of papers with a large number dominates the themes in economic and social journals. The publication of papers on the theme of COVID-19 and the role of halal food until August 2020 are totaling 52 papers. However, because 2020 has not been completed until the period of December 2020, the number of papers is still possible to increase and increase, the data collection of papers studied in this study is until August 2020.

The following table 1 shows some specific topics in the research paper on the theme of COVID-19 and the role of halal food. Based on the following table, it can be seen that the top 3 research topics used in this theme paper over the past year are 41 papers related to halal food consumption, then the topic of halal food development is 38 papers and the topic of the halal food industry totaling 36 papers. Each paper can contain more than one topic, so the number is more than the number of papers used as the object of research.
The research findings show that the number of researches on the COVID-19 theme and the role of halal food that is empirical is less than that of conceptual or mixed research. The research model that is widely used in qualitative methods is descriptive. The empirical research model that is widely used is multiple regression modeling. Then several papers collaborate both qualitative and quantitative approaches.

The total number of institutions affiliated with the paper's authors is 74 institutions from various countries worldwide. The most productive author-affiliated institution, in the first place, was the University of Malaya, which produced 15 authors, followed by the second rank, namely Baqiyatallah University of Medical Sciences, which produced 10 authors. The third rank was Universiti Teknologi MARA and Sepuluh Nopember Institute of Technology with 7 authors. Interestingly, institutions from Malaysia and Indonesia are quite productive compared to other countries' institutions in researching the theme of COVID-19 and the role of halal food.

Suppose authors from Malaysia and Indonesia dominated the COVID-19 theme paper and the role of halal food last year. In that case, the countries that are objects of research in the published paper on the theme of COVID-19 and the role of halal food, which is also still Malaysia and Indonesia, are dominated by the top 2 rankings.

The ranking of the countries that were the objects of research in the COVID-19 theme paper and the role of halal food in the last year as follows: in the first place, Malaysia surpassed other countries with the number of that examined 12 papers. Then the second rank is occupied by Indonesia with 10 papers, then the third rank is India, Iran and Thailand with 2 papers each and the rest 12 countries have been the object of research once.

B. Bibliometric Analysis

This part will present a graphic visual mapping of the COVID-19 theme paper's publication and the role of halal food. The keyword mapping analysis results form the basis for the co-occurrence mapping of important or unique terms contained in a particular article. Mapping is a process that allows a person to recognize elements of knowledge and their configuration, dynamics, interdependencies, and interactions.

Related to bibliometrics, science mapping is a method of visualizing a field of science. This visualization is done by creating a landscape map that can display topics from science. The visualization of the co-word map network for the publication of the COVID-19 theme paper and the role of halal food can be seen in Figure 1 below.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Halal Food Consumption</td>
<td>41</td>
</tr>
<tr>
<td>Halal Food Development</td>
<td>38</td>
</tr>
<tr>
<td>Halal Food Industry</td>
<td>36</td>
</tr>
<tr>
<td>Halal Food System</td>
<td>35</td>
</tr>
<tr>
<td>Halal Food Safety</td>
<td>34</td>
</tr>
<tr>
<td>Halal Food Service</td>
<td>33</td>
</tr>
<tr>
<td>Halal Food Standard</td>
<td>33</td>
</tr>
<tr>
<td>Halal Food Awareness</td>
<td>30</td>
</tr>
<tr>
<td>Halal Food Policy</td>
<td>28</td>
</tr>
<tr>
<td>Halal Food Supply Chain</td>
<td>27</td>
</tr>
<tr>
<td>Halal Food and Tourism</td>
<td>24</td>
</tr>
<tr>
<td>Halal Food and Travel</td>
<td>17</td>
</tr>
<tr>
<td>Halal Food Operators</td>
<td>17</td>
</tr>
<tr>
<td>Halal Food Certification</td>
<td>19</td>
</tr>
<tr>
<td>Halal Food Security</td>
<td>12</td>
</tr>
<tr>
<td>Halal Food Equity</td>
<td>6</td>
</tr>
</tbody>
</table>
In this mapping, several keywords that have often appeared in the COVID-19 theme paper and the halal food industry in the past year are displayed and their relation to other keywords in 4 clusters, namely:

- Cluster 1 in red consists of 12 keywords: attitude, better understanding, determinant, evidence, government, intention, marketer, marketing strategy, opinion, religiosity, theory, and variable.

- Cluster 2 in green consists of 12 keywords: author, business, country, COVID, demand, food, halal certification, halal standard, majority, Muslim, number, and review.

- Cluster 3 in blue consists of 8 keywords: addition, development, halal food industry, halal food supply chain, halal industry, halal product, Malaysia, and risk.

- Cluster 4 in yellow consists of 8 keywords: analysis technique, company, design methodology approach, factor, impact, influence, price, and primary data.

The keywords divided into the 4 clusters above are arranged in a colored circle indicating the clusters. This data can be used in determining the trend of the keywords in the last year. The bibliometric analysis shows several keywords widely used in the paper, which is the object of study. The keywords that appear in the larger circle indicates the most. Meanwhile, the line relation between keywords shows how much it is related to other keywords. It was found that the most familiar keywords are COVID, food, country, attitude, halal product, intention.

Furthermore, using the VOSViewer software, we found the authors' bibliometric mapping as in Figure 3 below. The bigger the circle of the author's name, shows the more papers he has published in the COVID-19 theme paper and the role of halal food in the last year.

The cluster density view is the item (label), marked the same as the visible item. Each item dot has a color depending on the density of the item at that time. This identifies that the color of the map points depends on the number of items associated with other items. This section is handy for obtaining an overview of the bibliometric map's general structure by paying attention to which parts of the items are considered essential to be analyzed. Through this worksheet, we can interpret the authors who have written the most publications.
Based on these results, a density map is displayed, which results from an analysis using all published articles on the COVID-19 theme paper and the role of halal food, both related and unrelated. There are many clusters sorted by author (indicated by colored circles). The most popular authors write publications related to the COVID-19 theme and the role of halal food based on bibliometric mapping, namely Iranmanesh and Mostafa. The order in this mapping may have a difference with the author's top-ranking if we calculate manually, but in addition to calculating the number of papers published on the COVID-19 theme and the role of halal food, VOSViewer also takes into account the number of linkages and citations with other authors.

Furthermore, the visualization of the journal mapping is depicted in bibliometric figure 4. Based on this image, several journal clusters appear to be listed in a glowing circle, indicating the journal's productivity in contributing to publishing its paper on the theme of COVID-19 and the role of halal food.
Most journals are counted in terms of the number of publications and number of links to other journals, where a paper author can write many papers in different journals. The ranking of the most popular journals shown by the bibliometric mapping results is the Journal of Islamic Marketing.

V. FINDINGS

The availability of halal food in various countries is undoubtedly different, whether influenced by the level of religiosity, prevailing norms, community behavior [26], education about halal from the available information media [27], the origin of the halal food brand [28], to image, trust and customer satisfaction [29]. This influence makes each country different in the halal food supply level, one of which is shown by the minimal availability of halal products in China [30] and currently, halal food is popular in Indonesia and Malaysia [31].

A report from The State of the Global Islamic Economy 2018 shows that Indonesia ranks first as the largest consumer of food products in the world with a value of USD 154.9 billion. However, the Indonesian government has not been able to maximize this market potential, as indicated by Indonesia's ranking that is still at tenth place in the category of world halal food-producing countries [32]. Therefore, Indonesia needs to improve the quality and quantity of halal food supply, especially during this pandemic, because the increasing demand creates opportunities. For example, tourists who visit certain countries are asked to remain in the room during the quarantine period but are still allowed to order food through room service [33].

Unlike Indonesia, in America, there are many communities, both individuals and organizations that have begun to coordinate long-term anticipatory actions from the impact of COVID-19, one of which is carried out by Feed Buffalo, an emergency food pantry or public kitchen that provides healthy and halal food for the community. Durban, one of the cities in KwaZulu-Natal, has also begun to pay attention to providing halal food for its people by improving halal food access services. Even Durban was chosen to host the World Halal Day 2020, whose implementation was delayed due to COVID-19 [34].

The halal food industry in Europe has also continued to develop rapidly in the past few years. Islamic shops that provide halal food are in great demand because the needs, according to Muslims' condition, are still not widely provided in shops in general [35]. One reason for this development is the increasing demand for halal certification and quality assurance in line with the tourism sector's development [36]. However, halal food development also needs to be balanced with halal meat provision in line with the increasing demand for meat in Europe [37].

On the other hand, understanding halal food's meaning and urgency influences consumer behavior and their purchase intention concerning sustainable consumption, so knowledge
and education about halal food need to be improved. Many companies have produced Islamic products, but their business is still related to the production process that is not acceptable in Islam [38]. A trust-based supply chain, such as a halal supply chain, is essential. Because, even though the food substance is halal, the process of getting it is not following the Sharia, then the food is not allowed based on maqashid Sharia [39].

Halal food is universal. It can be consumed by anyone, not only the Muslim community, while the Muslim community cannot consume non-halal food, even though, in fact, non-Muslim consumers rarely want to buy halal food products [40]. However, the halal food industry still has good prospects going forward. Halal food began to experience a stable reputation since the millennium and has its research niche [41].

VI. CONCLUSION

This research focuses on finding out the development of the COVID-19 theme and the halal food industry's issue in the world. The results show an increase in the number of published papers on this theme compared to other themes. Until August 2020, there have been more than 50 studies on this theme during the past year.

The top three research topics widely used are halal food consumption, halal food development and the halal food industry. The bibliometric mapping visualization shows that the map of research development in the COVID-19 field and the role of halal food is divided into 4 clusters.

One of the critical findings is, the period of the COVID-19 pandemic shows that there is enormous urgency in the need for a clean food supply, especially halal food. The COVID-19 pandemic cause is the problem of food that has not been paid attention to its health. The rules applied by Islam in food selection recommendations are essential to pay more attention to. The first COVID-19 case shows were exposed to the food market in Wuhan, China. This food market is known to provide food from animals that are not halal for consumption. Consumption of halal food in a sustainable manner can reduce the risk of a pandemic such as COVID-19 in the future. From the perspective of Islamic economics and finance, currently, it is a momentum to develop the halal industry, especially the halal food industry. In addition, several Islamic social finance schemes [42] can be used to mitigate the impact of COVID-19.

The results show that the number of articles on halal food published by the journal DOI Equipped is quite large and can increase along with the development of the demand for halal food and the Muslim community's awareness in the world. The results showed that several popular topics and keywords were used in this theme and could be developed further. Some of the most productive journals and authors can also be used to reference researchers who will develop research on this theme.

This study has several limitations. This research only focuses on knowing the development trend of topics, keywords, authors, and journals published on halal food. Of course, there are still many parts that can be explored. It should also be noted that the number of article collections studied was limited from 2019 to August 2020, so it is still possible to continue to experience changes and developments in the future. Suggestions for further research are to carry out a complete bibliometric analysis with more elements understudy or more diverse software to produce more comprehensive results.

Recommendations for practitioners are the need to improve the quality and quantity of halal food production and the application of innovation in the system to provide more varied product choices for the consumer community to meet the demand for halal food. The recommendation for academics is to research developing the halal food industry by continuing this bibliometric research with various other software such as R Biblioshiny and increasing its limitations. Research with these tools can be found, for example, research by Bollani and Chmet [43] related to mapping Islamic finance research.

REFERENCES


