

Twitter Sentiment Analysis on Halal Food using VADER

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The awareness of consuming halal food does not only come from Muslims, non-Muslims also think it is safer to buy halal products. Halal food is not only favored by Muslims but nowadays halal food is increasingly popular among non-Muslims due to several things such as the treatment of animals to be slaughtered, as well as the perception that halal food is much healthier and safer. This research is a study that uses sentiment analysis from a collection of tweets related to halal food. The data in this study were obtained from 2,831 tweets in January 2022. The method used is a qualitative approach with descriptive statistics from literature studies with the theme of halal food. The results of this study include the results of neutral sentiment having the highest percentage of 68%, followed by negative sentiment of 30.8%, and with the smallest percentage with 1.2% positive sentiment. The diversity of the results of this study comes from differences in opinion or due to the pros and cons of the halal food issue.

Keywords: Halal food; Sentiment; Twitter; VADER

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INTRODUCTION

Religious beliefs play an important role in shaping social behavior. Differences in beliefs can affect lifestyles, choices made, what they eat. In accordance with the opinion of [Feeley-Harnik \(1995\)](#) that the relationship between religion and food cannot be separated. According to [\(Soesilowati, 2010\)](#) Muslim respondents place a high priority on the issue of halal food consistently when buying food, buying meat/food ingredients, as well as restaurant selection.

The State of the Global Islamic Report in 2019 stated that the Muslim population around the world spent around \$1.17 trillion by 1.9 billion Muslims on halal food and beverages. Surely the halal food market is potentially promising with Islam currently being the fastest growing religion in the world [\(Ismail, 2015\)](#). Globally, the halal food industry has a growth rate of 7% per year [\(Aziz and Chock, 2013\)](#).

The awareness of consuming halal food does not only come from Muslims, non-Muslims also think it is safer to buy halal products. Halal food is not only favored by Muslims but nowadays halal food is increasingly popular among non-Muslims due to several things such as the treatment of animals to be slaughtered, as well as the perception that halal food is much healthier and safer [\(Rezai et al., 2012\)](#). This condition increases the market for halal food as a safe, hygienic, quality, and healthy product.

However, halal food or halal products are not easy to verify because texture, odor, or taste cannot determine whether food is halal [\(Fischer, 2016\)](#). So most Muslim consumers rely on halal certification and labeling to assess whether the food products to be consumed are produced with halal practices as well [\(van der Spiegel et al., 2012\)](#). Therefore, halal certification is also closely related to halal food or other halal products. This is needed especially in minority countries to reduce the skepticism of the Muslim community towards the food products offered.

In the development of the global halal food industry is increasing. Halal is no longer a small niche market, but more and more a global market [\(Atalan-Helicke, 2015\)](#). The development of literature studies is also increasing. Not only that, the more halal food is recognized globally, it also generates various opinions and conversations both on social media, publication articles, and existing literature studies. With a variety of opinions appearing in the public domain globally, there are pro and con opinions that show how public sentiment regarding the development of halal food.

Therefore, this study aims to examine the level of sentiment related to halal food from the opinions of Twitter users through sentiment analysis. The data analyzed consisted of 2,831 tweets in January 2022. The data is then processed and analyzed using the python programming language with the Vader Sentiment Analysis library to determine the level of sentiment regarding halal food.

LITERATURE REVIEW

Research [\(Ali, 2016\)](#) revealed that sharia provisions regarding food, beverages, and halal and haram goods are an integral part of Islamic teachings. According to [\(Golnaz, et al., 2010\)](#) the concept of halal emphasizes the safety, cleanliness, and wholeness of food. Consideration of the place and process of slaughtering animals is most important, the condition of these animals will not harm the health of visitors, is the main focus of something halal. Previous research has identified religiosity as a moderating variable [\(Machali, et al., 2013\)](#) which shows the result that religiosity can be a variable that can increase or decrease the relationship between halal food awareness and purchasing decisions.

The halal logo on halal food is important to consider, because it signifies trust and also the quality of halal food for consumers [\(Bonne and Verbeke, 2008; Wibowo and Ahmad; 2016\)](#). Therefore, most Muslim consumers rely on halal certification and labeling to assess whether the food products to be consumed are produced with halal practices as well [\(Van der Spiegel et al., 2012\)](#). It can be concluded that halal logos and halal certification have an important role in the development of the halal food industry. Especially with the aim of reducing uncertainty, because halal food or halal products are not easily verified because texture, smell, or taste cannot determine whether the food is halal [\(Fischer, 2016\)](#).

Currently, halal food is considered a special cuisine offered to both Muslim and non-Muslim consumers and is available in various outlets [\(Battour et al., 2021; rahman et al., 2020\)](#) due to concerns in health, environmental and quality issues of food [\(Olya and Al-Ansi, 2018\)](#), including food standards related to human welfare, sustainability and social justice [\(Zainal abidin et al., 2011\)](#). Halal food has received a positive response by non-Muslims in several studies that have been conducted [\(Golnaz, Zainalabidin, et al.; Haque et al., 2015\)](#).

[Mathew et al. \(2014\)](#) found that non-Muslims have been attracted to the concept of halal food. Because halal food is reflected in its cleanliness.

Experience is also an important element in determining views on halal food. [Damit et al., \(2018\)](#) state that the experience of consuming halal food affects a positive perspective in assessing halal food. However, research by [Mustafa, \(2018\)](#) found that there is a collection of emotions about halal food through sentiment analysis on tweets related to the topic of halal food. With the results of positive, neutral, and negative sentiment towards the topic of halal food on the Twitter application. The analysis is based on geo-location which shows various emotions related to halal food globally from Twitter Application users.

RESEARCH METHODOLOGY

This study emphasizes Twitter as the source of data collection for this research. Twitter is a platform that provides public opinion in 140 characters, which can be used to analyze data more effectively than long text content and multiple sets of photos. The data in this study was collected from Twitter with the keyword "halal food" for a period of one month (January 2022). A common method to collect tweets from Twitter is through the website's application programming interface (API), which allows developers and researchers to collect data. However, the API has many limitations; it returns tweets only from the last seven days and allows only a limited number of requests to Twitter's servers. To overcome these constraints, we chose to collect data through Twitter's website search feature, using Python scripts ([Izza et al., 2023](#); [Hakim, 2023](#); [Maulida & Devi, 2023](#)). The dataset included unduplicated and related tweets to the topic of tourism based on the previously mentioned keywords. The final dataset included 2831

halal food-related tweets in 22 indicated languages. To ensure the relevance of the tweets, we randomly filtered the dataset and manually analyzed 100 tweet texts. We observed that the tweets can be grouped into three categories: halal food promotion, halal food education, halal food recommendation, and comments on halal food. The data collected through twitter has not been cleaned for hashtags in the tweets.

RESULT AND DISCUSSION

Sentiment Analysis

This research analyzes sentiment from tweets of Twitter application users related to halal food. This research uses the Python programming language library, Textblob. As a primary data source, 2831 data were analyzed in this study, classified into three types of groups: namely positive, neutral, and negative. This classification is obtained from measuring the polarity of each tweet. The classification is based on the polarity value. Tweets with a polarity value of more than 0 to 1 are classified as a positive group. Tweets with polarity less than 0 to -1 are classified as negative. Tweets with a polarity value of 0 are classified as neutral. The diagram below shows sentiment analysis on the theme of *Halal Food*.

The diagram above explains the data that tweets with neutral classifications related to *halal food* in January 2022 have the largest number as much as 67.9% of the *sentiment polarity* results. Followed by tweets with negative classifications related to *halal food* as much as 30.9%. While positive tweets about halal food have the smallest percentage, namely 1.2%.

Sentiment Polarity on Tweets Data

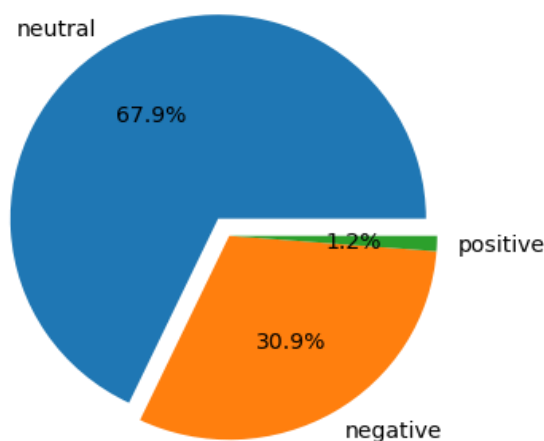


Figure 1. Sentiment polarity on halal food

The table below explains the number of tweets from various languages by counting the tweet ids in the tweets that have been collected. There are 2831 tweet ids that have tweeted about halal food in January 2022. It can be seen in the table that tweets using English about

halal food have the highest number, namely 2279 tweet ids. In the second position there are tweets in Indonesian that discuss halal food as many as 263 tweet ids. Followed by tweets about halal food in tagalog language as many as 106 tweet ids.

Table 1. Number of tweets on halal food

Country	Language code	Count of Tweet Id
Welsh	cy	1
German	de	2
English	en	2279
Spanish	es	5
Estonian	et	5
French	fr	15
Hindi	hi	14
Haitian	ht	1
Hungarian	hu	3
Indonesian	in	263
Japan	ja	87
Malayalam	ml	4
Dutch	nl	3
Oriya	or	1
Portuguese	pt	2
Tamil	ta	1
Thai	th	4
Tagalog	tl	106
Turkish	tr	9
Undetermined	und	9
Urdu	ur	13
Chinese	zh	4
	Grand Total	2831

This shows that halal food has become a lot of discussion and conversation in the universal language, namely using English which is the most tweet id. Although the discussion about halal food still reaps the pros and cons in tweets uploaded by twitter users with various languages. With the sentiment polarity results showing a negative group with the largest number of tweets about *halal food*. Although it does not rule out the possibility that the sentiment polarity results will continue to change because the discussion about halal food is a dynamic discussion from time to time. Future sentiment analysis updates are needed regarding the discussion of *halal food*.

Keyword Analysis

From the results of keyword mapping through twitter wordcloud, keywords used in the discussion of halal food are found which can be seen in the figure 2. This data can be used to determine keyword trends regarding halal food in January 2022. According to the mapping results above, it can be concluded that the most used keywords in this discussion besides halal food are *Muslim, eat, halal, non-halal, restaurant, chan (public figure), halal run, people, will, and chinese*. The following are the 10 most used keywords in the discussion of *halal food* on the Twitter application in January 2022.

sentiment polarity results will continue to change because the discussion about halal food is a dynamic

discussion from time to time. Future sentiment analysis updates are needed regarding the discussion of *halal food*.

Table 3. Top keywords on halal food

No.	Keywords	No.	Keywords
1	Halal food	6	Restaurant
2	Muslim	7	Chan (Public Figure)
3	Eat	8	Halal run
4	Halal	9	People
5	Non-halal	10	Chinese

The keywords that are often used in tweets with the theme of *halal food* are summarized in the table above. Based on mapping in wordcloud in the Twitter application in January 2022, various keywords related to *halal food* were found. Although it does not rule out the possibility that the most used keywords will continue to change because the discussion about *halal food* is a dynamic discussion from time to time. It is necessary to update the word cloud analysis to update the keywords used in the future regarding the discussion of *halal food*.

The neutral sentiment is influenced by the surge in global interest in boosting the halal industry. Due to the efforts of several academics and corporate policymakers in recent years, the public awareness and relevance of this market has increased. (Dahlal & Saniff, 2019). The business volume of this market spans fifty countries worldwide, making it a promising and attractive market segment (Vizano et al., 2019). Due to its strong concerns about health, environment, and quality, halal food and products can be expanded to cover various market groups, including both Muslim and non-Muslim clients (Zailani et al., 2020).

Despite the importance of the halal market, both businesses and customers have a limited understanding of how this complex phenomenon, derived from Islamic Sharia law, operates and is implemented. Nonetheless, businesses and service providers require a greater understanding of halal customer attitudes and behaviors. (Al-Ansi et al., 2019). It is crucial for businesses and services to understand how to build halal customer trust, satisfaction, and loyalty. To build a target marketing plan, marketers must first gain a fundamental understanding of the diversity of halal customer behavioral responses across demographic categories. The supply needs of halal products and their specificities are explored to meet the needs of halal consumers in both Muslim and non-Muslim destinations. (Zulfakar et al., 2014).

As more and more foods become available in the market, Muslim customers around the world are

becoming increasingly concerned about the legitimacy of halal cuisine. To guarantee that the information on food labels and elsewhere offered to Muslims is correct, they deserve protection. (Subharto et al., 2020). The origin of ingredients is usually not listed on ingredient labels. Another important issue for Muslim consumers is hidden substances from various sources (Vanany et al., 2020). The food industry's increasing desire for transparency has accelerated the development of methods to analyze food ingredients. Thus, there is a lot of concern among non-halal food producers if their business will be threatened. This is the basis for quite a lot of negative sentiment reaching 30 percent.

Halal authenticity has recently become a major source of concern in the food industry (Ahmad et al., 2020). There are many incidents of haram or shubhat substances being used in food management. In addition, with the advancement of modern science and technology, food has gone through various processes and has been transported to different parts of the world, causing Muslim consumers to worry and want to know whether processed food contains haram components. Disclosure of pork and fat incorporated into food and meals has emerged in recent years. Some countries are increasingly incorporating pork and lard in their food products to increase their economic benefits.

Several studies in the field of halal food look at what motivates Muslims to buy halal goods. Furthermore, Talib et al. (2016) showed that certification can improve the inventive performance of halal-certified food companies, with considerable differences in terms of innovation between halal-certified and non-certified companies. As a result, halal food certification is also necessary. The necessity of halal food supply chain comes from the basic quality of the product and market requirements (Secinaro & Calandra, 2021). As a result, the need to maintain quality throughout the supply chain makes businesses implement strict standards from raw material processing to sales.

CONCLUSION

This study measures the sentiment level of Tweets on the issue of *halal food*. The sentiment assessment regarding *halal food* from the collection of Tweets obtained the most neutral sentiment results, namely 68%, followed by negative sentiment as much as 30.8% and positive sentiment as much as 1.2%. This illustrates how the level of sentiment in tweets about *halal food*. With the dominance of sentiment is neutral, then followed sequentially by negative sentiment and the last is negative sentiment with a percentage of 1.2%. The benefits obtained in this study can be used as a reference and consideration regarding the issue of *halal food*. The limitation in this study is that the data source is only obtained from a collection of tweets in January 2022 which amounted to 2,831. This research was conducted using sentiment analysis which can make readers receive a generic representation of significant data. The results obtained in this study are dynamic and can change as the economy, technology, and other variables develop.

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