Firdaus Journal
Vol 5 No. 2 2025 (62-69)

HALAL ASSURANCE SYSTEM FOR AUTHENTIC INDONESIAN KOMBUCHA

Tuti Rostianti Maulani
Mathla'ul Anwar University-Banten Indonesia, Indonesia
Corresponding author: tutirostianti@gmail.com

Received: 25 December 2024 **Revised:** 27 November 2025; **Accepted:** 14 December 2025; **Published:** 28 December 2025

To cite this article (APA): Maulani, T. R. (2025). Halal Assurance System for Authentic Indonesian Kombucha. Firdaus Journal, 5(2), 62-69. https://doi.org/10.37134/firdaus.vol5.2.6.2025

ABSTRACT

Kombucha, a fermented beverage made from tea and sugar with the help of a symbiotic culture of bacteria and yeast (SCOBY), is gaining popularity in Indonesia due to its health benefits. However, the fermentation process, which produces small amounts of alcohol, raises questions about its halal status among Muslim consumers. According to the Indonesian Council of Ulama (MUI), kombucha can be classified as a halal beverage as long as the alcohol content produced during fermentation remains below the prescribed limit of 0.5%. MUI confirms that kombucha with a low alcohol content is not intoxicating and is therefore permissible for consumption by Muslims. This result of discusses the production process of kombucha, its halal status according to MUI, and the importance of monitoring the fermentation process to ensure the alcohol content remains within permissible limits.

Keywords: bacteria, alcohol content, kombucha, MUI, Indonesia

INTRODUCTION

Kombucha is a fermented beverage that is increasingly popular worldwide due to its health benefits. It is made from tea (typically green or black tea) fermented with the help of a symbiotic culture of bacteria and yeast known as "SCOBY" (Symbiotic Culture of Bacteria and Yeast). This fermentation process results in a beverage rich in organic acids, vitamins, enzymes, and probiotics, which are beneficial for health. Kombucha is known for various health benefits, some of which have been supported by research, including improving digestive health (Kitwetcharoen *et al.* 2023). Kombucha contains probiotics that can support the gut microbiota, which is essential for digestive health. These probiotics help maintain the balance of good bacteria in the gut, which can help alleviate digestive issues such as diarrhea and irritable bowel syndrome (Greenwalt *et al.* 2000). The organic acids and antioxidants in kombucha can help boost the immune system. Kombucha made from green tea also contains catechins, compounds with strong antioxidant properties that can help the body fight free radicals and inflammation. Some studies suggest that consuming kombucha can help regulate blood sugar levels, especially in individuals with type 2 diabetes. This effect may be due to kombucha's ability to increase insulin sensitivity (Malhotra *et al.* 2024).

Kombucha tea is functional drink because of the fermentation that is carried out by the symbiotic culture in the form of kombu mushrooms, dipo mushrooms or bull mushrooms. The chemical composition of kombucha tea has health benefits too, namely the content of polyphenols which are used as antioxidants. Several research results can be concluded that

the length of fermentation time affects the existence of factors related to the yield of kombucha tea such as affecting the color of SCOBY, reducing total microbes, affecting antioxidant activity, and increasing the chemical content of phenol in kombucha tea, and so on (Firdaus *et al*. 2020). Kombucha has become one of the most popular beverages among health-conscious consumers worldwide, including in Indonesia. This beverage, known for its distinctive taste and health benefits, is the result of tea fermentation with sugar using a symbiotic culture of bacteria and yeast. However, as a fermented product containing a certain amount of alcohol, questions about the halal status of kombucha are a primary concern for Muslim consumers. Halal is any object or activity that is allowed to be used or carried out, in Islam. This term in everyday vocabulary is more often used to indicate foods and drinks that are allowed to be consumed according to Islam, according to the type of food and how it is obtained (Majidah *et al.* 2022).

The Halal Product Assurance Agency (BPJPH) of the Indonesian Ministry of Religious Affairs, responsible for halal certification in Indonesia, through the Indonesian Council of Ulama (MUI) Fatwa Number 10 of 2018 concerning food and beverages containing alcohol or ethanol, has issued a decision clarifying the halal status of kombucha products. According to the MUI fatwa, kombucha can be classified as a halal beverage as long as the alcohol content produced during fermentation does not exceed 0.5%. MUI states that beverages with alcohol content below this threshold are not intoxicating and are therefore considered halal and suitable for consumption by Muslims. Additionally, MUI emphasizes the importance of strict monitoring during kombucha production to ensure that the alcohol content remains within permissible limits. Kombucha producers in Indonesia seeking halal certification must submit their products for testing and examination by MUI to ensure that the products meet the established halal standards.

The purpose of this research is to ensure that kombucha is in compliance with MUI guidelines and decisions. Thus, Muslim consumers in Indonesia can consume kombucha with the assurance that the product is halal, as long as its alcohol content is within the allowed limits. However, consumers are still advised to check the labels and information from producers regarding alcohol content and the halal certification status of the products they intend to purchase. For producers, MUI halal certification not only provides assurance to Muslim consumers but also enhances consumer trust overall and expands the market for their products. This certification is a symbol of commitment to quality and adherence to the standards applicable in Indonesia.

METHODOLOGY

a. Materials

Kombucha samples were taken from small and medium enterprises (SMEs) in Banten Province, Indonesia, with three flavor variants: green tea, lemon, and strawberry. Gas chromatography (GC FID-HS) was used for alcohol content analysis, conducted at the Regional Health Laboratory of Banten Province, Indonesia. Seven criteria were used to assess the halal status of the products based on BPJPH Ministry of Religious Affairs standards.

b. Procedure

Alcohol Content Analysis Using Gas Chromatography (GC)

The method used was a modified version of ([AOAC, 2019]) Kombucha samples were diluted with deionized water to achieve a concentration suitable for the GC detection range. An internal standard (n-propanol) was added to the samples to assist in alcohol quantification. The kombucha samples were placed in sealed vials and heated, and the vapor collected in the headspace was analyzed by GC. A capillary column was used as the stationary phase to separate ethanol, such as a polar column (135-tris(2-cyanopropoxy) benzene column). A flame ionization detector (FID) sensitive to alcohol was used. The inlet temperature, oven, and

detector were adjusted according to the column and instrument specifications. The injector temperature was set at 200–250 °C, the oven temperature started at 40 °C and increased gradually, and the detector temperature was set around 250–300 °C. Prepare ethanol standard solutions of known concentration and create a calibration curve by plotting the detector response against the ethanol concentration. Use the internal standard to determine the response factor and ensure the accuracy and precision of the analysis. Inject the prepared kombucha samples into the GC system. Ethanol will be separated in the GC column and detected by FID. Calculate the ethanol concentration in the samples based on the ethanol peak area in the chromatogram and the response factor obtained from the calibration curve. Perform testing to ensure the accuracy and precision of the method by analyzing standard samples of known concentration. Determine LOD and LOQ to ensure the method can detect and measure very low ethanol concentrations as required by halal product specifications.

Halal Criteria Based on BPJPH Ministry of Religious Affairs Standards

1. Materials
   Documentation: Verify the documentation of raw materials, additives, and auxiliary materials used in the product.
   Field Visit: Conduct an on-site inspection of the storage facilities to ensure the materials are free from impurities and prohibited substances.
   Laboratory Testing: Send material samples for testing at accredited laboratories to ensure they are free from contamination with prohibited substances.
2. Production Process
   Process Documentation: Review SOP (Standard Operating Procedure) documents for the production process to ensure they comply with halal principles.
   Direct Observation: Conduct an on-site inspection of the production line to ensure there is no cross-contamination between halal and non-halal products.
   Interview: Interview production line workers to ensure understanding and compliance with halal procedures.
3. Storage and Transportation
   Documentation: Review documentation related to the storage and transportation of halal products.
   Physical Inspection: Visit warehouses and transportation facilities to ensure halal products are stored and transported in separate and secure conditions.
   Interviews: Interview warehouse staff and transport drivers to ensure understanding and implementation of halal procedures.
4. Sanitation and Hygiene
   a. Documentation: Inspection of production facility cleanliness and sanitation records.
   b. Direct Observation: Inspection of facilities to ensure cleanliness and sanitation standards are met according to halal requirements.
   c. Microbiological Testing: Taking environmental samples to be tested in the laboratory to ensure cleanliness and the absence of unclean contamination.
5. Employees
   a. Documentation: Inspection of employee training documents related to halal procedures.
   b. Interview: Interview with employees to assess understanding and implementation of halal procedures in daily work.
   c. Observation: Observing employees during the production process to ensure compliance with halal procedures.
6. Halal Certification and Guarantee System (SJH)
   a. Documentation: Inspection of HAS documents, including halal policies, halal manuals and internal audit records.
   b. Internal Audit: evaluate the results of internal audits to ensure the halal guarantee system is running effectively.

c. Review and Validation: review and validate all documents and audit results to ensure compliance with all BPJPH halal criteria.

RESULTS AND DISCUSSION

a. Alcohol Content of Kombucha

Indonesia is a country that has the largest Muslim community in the world. It is appropriate for the government to create the products of the community to prepare Halal consumes needed by Muslims in Indonesia. For Muslim consumers, the halal status of kombucha is crucial to ensuring that the product consumed complies with Islamic law. This includes ensuring that all materials, production processes, and equipment used do not violate halal principles. Kombucha must be free from prohibited substances such as alcohol (especially if the alcohol content exceeds the allowable limit) or non-halal additives. The production process must also adhere to halal standards. Halal certification provides assurance that kombucha is produced with strict hygiene and halal standards, offering peace of mind to Muslim consumers. Halal-certified products can reach a broader and more diverse market, including non-Muslim consumers who may prefer products with guaranteed cleanliness.

An analysis of alcohol in kombucha is essential, as kombucha is a fermented product that can produce alcohol. Kombucha is a traditional beverage made from tea with sugar fermented by yeast and acetic acid bacteria (Tran *et al.* 2020). Figure 1 shows the kombucha products analyzed for halal certification through the BPJPH Ministry of Religious Affairs.

Figure 1: Indonesian Kombucha Products

The results of the alcohol content analysis in kombucha can be seen in Table 1. The alcohol analysis results show values below 0.5%, which serves as the basis for declaring the analyzed kombucha as halal according to the standards set by MUI (Indonesian Council of Ulama).

Table 1: Alcohol Content Analysis Results of Indonesian Kombucha

Analysis	Sampel	Result (%)	MUI Standard
Kadar Alcohol	Kombucha green tea Kombucha Lemon Kombucha Strawberry	0.34	0.5% Max

The results of kombucha analysis approved by the fatwa of the Indonesian Ulema Council (MUI) based on the halalness of the product must demonstrate sharia principles. Kombucha that receives halal certification from the MUI must use ingredients that meet halal standards. This means that ingredients such as sugar, tea and other additives must not contain haram elements. MUI verifies that all ingredients used in the fermentation process are halal and there are no additional ingredients that violate sharia principles.

The kombucha fermentation process, which involves microorganisms such as bacteria and yeast, must be carried out in a way that does not violate halal principles. One of the main

concerns is ensuring that the alcohol produced during the fermentation process does not exceed the permissible limits in the final product. Halal kombucha must ensure alcohol levels within permitted limits, usually less than 0.5% in the finished product.

Equipment used in kombucha production must be clean and free from contamination with haram ingredients. MUI considers that the production process must maintain cleanliness and there is no cross-contamination with haram products. Kombucha products that have been approved by the MUI usually come with a halal certificate. This certification guarantees that the product has been thoroughly checked and complies with halal standards. MUI also carries out regular supervision to ensure compliance with halal standards.

b. Results of determining halal criteria for Indonesian Kombucha

1. Raw Materials

The raw materials used in making kombucha are based on status in the Halal Guarantee System. There are several ingredients included in the list that are questionable, so their halal validity needs to be carried out (Table 2). If the material is on the positive list, it indicates that the material has been declared safe and halal (no longer requires halal inspection.

Table 2: Kombucha Raw Materials used in halal inspection

No	Name and Brand	Doubtful	Halal Certificate Number	Validity period Halal Certificate	Status
1	Lemon	No			Positive List
2.	Pineapple	No			Positive List
3.	Strawberry	No			Positive List
4	Granulated Sugar "Gulaku:	Yes	LPPOMUI 00230096380619	17 June 2025	Oke
5	Bottle Drinking Water	Yes	LPPOMUI 01121001460602	27 December 2026	Oke
6.	Scoby (*Symbiotic Culture of Bacteria and Yeast*)	Yes	LPPOM MUI 00120219480823	15 August 2027	Oke
7.	Green Tea	Yes	BPJPH No		
8	Black Tea	Yes	ID321100005725109 22	11 November 2026	Oke
9	Lime	No			Positive list
10	Mint	No			Positive list

2. Process Production

The production process is recorded in the form of a flow diagram and recorded in the form of Table 3

Table 3: Kombucha Process

Criteria	
Process Production	The production process involves adding tea and sugar to be used as a Scoby fermentation medium for 14 days, then adding fresh fruit to ferment for 3 days, then bottling in a sterile manner.

3. Storage and transportation

Storage and transportation are carried out in accordance with provisions that meet the criteria in the Halal Guarantee System (Table 4).

Table 4: Product handling does not comply with the criteria

Criteria	
Handling of Non Halal Conformance Products (Penanganan Produk yang Tidak Memenuhi Kriteria)	**Application** 1. Procedures refer to the HAS manual along with definitions. Company owners understand the definition of products that do not meet the criteria. 2. Products that do not meet the criteria will be withdrawn and destroyed. 3. Available product forms that do not meet the criteria

4. Sanitation and Hygiene

The importance of hygiene and sanitation in the halal guarantee criteria makes products not only halal but also thoyib (safe). Determination of sanitation and hygiene criteria is shown in Table 5.

Table 5: Food Safety of halal kombucha products

Criteria	
Food Safety	**Application** 1. The production space is adequate and easy to clean 2. Production equipment is maintained and clean. 3. Production floors and equipment are cleaned every day (after the production process) 4. Toilet outside the production room 6. Closed trash cans are available in the production room and in the eating area 7. Employees work using: aprons and head coverings, 8. Hand washing rules are available.

5. Employees

Management and employees are important critical points in the halal guarantee system/ Implementation must follow BPJPH criteria (Table 6)

Table 6: Management and Employees in SJH Kombucha Indonesia

Criteria	
Internal Audit	**Application** 1. The internal audit was carried out on September 20 2023 2. The section being audited is the section that includes critical activities. 3. There is evidence of the internal audit answer checklist in the HAS manual.

continued

Management Review	**Application:** 1. The management review will be held on September 23, 2023 2. Attended by company leaders

6. Halal Product Guarantee Certification (SJPH)

Results that meet the criteria will receive product halal certification issued by BPJPH, Ministry of Religion of the Republic of Indonesia through an MUI fatwa. Figure 2 is the BPJPH halal certificate from the Indonesian Ministry of Religion.

REPUBLIK INDONESIA
(REPUBLIC OF INDONESIA)
جمهورية إندونيسيا
SERTIFIKAT HALAL
(HALAL CERTIFICATE)
شهادة الحلال

Nomor Sertifikat / *Certificate Number*: ID36110016415560723 — رقم الشهادة

Berdasarkan keputusan penetapan halal produk Majelis Ulama Indonesia nomor :
Based on the decree to stipulating halal products of the Indonesian Council of Ulama :
استنادا على قرار مجلس العلماء الإندونيسي عن تحديد الحلال للمنتجات :
QS-17140000080324 Tanggal 26 Maret 2024

Jenis Produk / *Type of Product*	Minuman dengan pengolahan	نوع المنتج
Nama Produk / *Name of Product*	-Terlampir / As Attached-	اسم المنتج
Nama Pelaku Usaha / *Name of Company*	Hei Booch !!	اسم الشركة
Alamat Pelaku Usaha / *Company's Address*	VIVACIA G3 NO 10 PAGEDANGAN PAGEDANGAN, KAB. TANGERANG, BANTEN, -, INDONESIA	عنوان الشركة
Diterbitkan di Jakarta pada / *Issued in Jakarta on*	27 Maret 2024	أصدرت الشهادة بجاكرتا في

telah memenuhi ketentuan perundang-undangan
Has complied with the provision of laws and regulations
قد استوفت أحكام التشريع

KEPALA
BADAN PENYELENGGARA JAMINAN PRODUK HALAL
HEAD OF HALAL PRODUCT ASSURANCE BODY
رئيس وكالة ضمان المنتجات الحلال

Muhammad Aqil Irham

Figure 2: Origin Indonesian BPJPH Kombucha Halal Certificate

CONCLUSION

Kombucha can be enjoyed by Muslim consumers in Indonesia as long as it is produced according to the guidelines set by the Indonesian Council of Ulama. By keeping the alcohol content below 0.5% and obtaining halal certification from MUI through the BPJPH Ministry of Religious Affairs, kombucha can be considered safe and halal for consumption. Thus, Muslim consumers can enjoy the health benefits of kombucha without concerns regarding its halal status.

ACKNOWLEDGEMENTS

We would like to thank the Research and Community Service Institute (LPPM) of Universitas Mathla'ul Anwar Banten, Indonesia, for funding this research.

REFERENCES

AOAC International. (2019). AOAC Official Method 942.06: Alcohol (Ethyl) in Beverages by Gas Chromatography. In Official Methods of Analysis of AOAC International (21st ed.). AOAC International.

BPJPH Kementerian Agama RI. (2020). Peraturan Pemerintah Nomor 31 Tahun 2019 tentang Pelaksanaan Undang-Undang Nomor 33 Tahun 2014 tentang Jaminan Produk Halal. Kementerian Agama RI.

Kementerian Agama RI. (2014). Undang-Undang Nomor 33 Tahun 2014 tentang Jaminan Produk Halal. Kementerian Agama RI.

[AOAC]. Official Methods of Analysis of AOAC International.

Firdaus, Indah, Isnaini A. (2020). “Review” Teh Kombucha Sebagai Minuman Fungsional dengan Berbagai Bahan Dasar Teh. *Prosding Semin Nas Unimus*. 3(2013):715–730.

Greenwalt CJ, Steinkraus KH, Ledford RA. (2000). Kombucha, the fermented tea: Microbiology, composition, and claimed health effects. *J Food Prot*. 63(7):976–981. doi:10.4315/0362-028X-63.7.976.

Kitwetcharoen H, Phung LT, Klanrit P, Thanonkeo S, Tippayawat P, Yamada M, Thanonkeo P. (2023). Kombucha Healthy Drink—Recent Advances in Production, Chemical Composition and Health Benefits. *Fermentation*. 9(1). doi:10.3390/fermentation9010048.

Majidah L, Gadizza C, Gunawan S. (2022). Analisis Pengembangan Produk Halal Minuman Kombucha. *Halal Res J*. 2(1):36–51. doi:10.12962/j22759970.v2i1.198.

Malhotra Y, Choudhary P, Gupta K. (2024). Natural Carbonated Drink (Kombucha Tea) and its Health Benefits: A Review. *J Nat Remedies*. 24(2):255–269. doi:10.18311/jnr/2024/34587.

Tran T, Grandvalet C, Verdier F, Martin A, Alexandre H, Tourdot-Maréchal R. (2020). Microbial Dynamics between Yeasts and Acetic Acid Bacteria in Kombucha: Impacts on the Chemical Composition of the Beverage. *Foods*. 9(7). doi:10.3390/foods9070963.