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**JOURNAL  
OF HALAL QUALITY AND CERTIFICATION**

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**ČASOPIS  
ZA HALAL KVALITET I CERTIFICIRANJE**

## JOURNAL OF HALAL QUALITY AND CERTIFICATION

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## Foreword

It is our pleasure to present the second issue of the Journal of Halal Quality and Certification, which continues its mission of promoting research and knowledge exchange in the field of halal quality, certification, and halal standards. This issue brings valuable scientific papers and analyses that contribute to the understanding of key aspects of the halal industry, consumer perceptions, and legal norms shaping this sector.

The first paper in this issue, "Application of Rapid Enzyme Tests for Detecting Ethanol in the Validation of Halal-Certified Products", introduces innovative methods for detecting ethyl alcohol in the process of halal certifications and halal-certified products, emphasizing the significance of rapid tests in ensuring halal integrity.

The study "Consumer Attitudes in the Tuzla Canton Regarding Halal Nutrition" examines consumer attitudes in the Tuzla Canton regarding the impact of halal nutrition on reducing health risks associated with obesity and non-communicable diseases, analyzing their awareness, dietary habits, and the need for education on the nutritional aspects of halal food.

The paper "Sharia Legal Treatment of Fruits and Vegetables Grown Using Animal-Based Organic Fertilizer," analyzes the Sharia legal treatment of fruits and vegetables grown using animal-based organic fertilizers, with a special focus on food safety, hygiene standards, and the application of Islamic legal norms in modern agriculture.

The paper "Responsibility at Work" addresses professional responsibility and ethical norms in the workplace, with a particular focus on the halal industry and its business standards.

The study "Research on Consumer Perception Towards Halal Products" investigates consumer perception, trust, and needs regarding halal products, identifying key trends, obstacles, and recommendations for improving product availability, education, and certification process transparency to strengthen trust and enhance the halal market segment.

These papers represent a significant contribution to advancing knowledge on halal quality and certification. We hope they will serve as a valuable resource for researchers, industry professionals, and policymakers. We extend our gratitude to the authors for their dedicated work, as well as to the reviewers and editorial team for their contributions in ensuring the quality of this issue.

With best wishes for further academic and professional development, we invite researchers to continue contributing to the advancement of knowledge in the field of halal quality and certification.

Sincerely,

*Ptof. Dr. Midhat Jašić, Editor-in-Chief*

*Dr. Sci. Damir Alihodzic, Editor*

*December 2024*

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## JOURNAL OF HALAL QUALITY AND CERTIFICATION

### Application of Rapid Enzyme Tests for Detecting Ethanol in the Validation of Halal-Certified Products

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Original scientific paper



#### ABSTRACT

Halal quality represents the totality of characteristics of products and services that meet the fundamental attributes of quality, such as health and hygiene safety, as well as compliance with halal standard requirements and Islamic dietary regulations. Halal product certification is carried out proactively using a preventive method to prevent the mixing or occurrence of any amount of ingredients that may have haram status. The modern food production process necessitates the use of rapid methods and techniques for analyzing the origin and quality of food, which is particularly emphasized in the production of halal products.

The aim of this study was to validate rapid enzymatic tests for detecting ethanol in prepared samples and finished products and to determine their applicability and reliability in analysis.

For the detection of alcohol in products and samples, the XEMATest Alco – an enzymatic test for the semi-quantitative determination of ethanol in samples, produced by XEMA Co. Ltd., was used.

For the purpose of this research, 90 analyses were conducted on 18 samples, of which 10 samples were prepared with different ethanol contents ranging from 0.02% to 10%, while 8 samples consisted of commercial alcoholic and non-alcoholic beverages.

The rapid enzymatic tests confirmed the presence of alcohol in the samples where alcohol was added, as well as in two alcoholic beverages whose labels stated that they contained 5% and 5.5% alcohol.

Out of all samples, ethanol was detected in 55 analyses, while 35 analyses showed no ethanol presence. The tests did not produce any false positive or false negative results. The determined sensitivity and specificity of the enzymatic test were 100%, with a false positive rate of 0%, error  $\alpha < 5\%$ , false negative rate of 0%, and error  $\beta < 5\%$ .

**Keywords:** rapid tests, detection, ethanol, halal products.

#### Introduction

The word halal refers to all things and actions that are permitted according to Islamic regulations. In

modern usage, this term is most commonly associated with food. Halal food includes foods and beverages that are permissible for consumption according to Islamic rules and meet

the requirements of halal standards (Jašić & Alihodžić, 2022).

For food or food products to be halal-certified, they must undergo a process of halal implementation, verification, and, in many cases, validation. Implementation involves adapting raw materials and processes to meet halal standard requirements. Verification follows implementation and entails assessing the products and production processes. This is conducted by a third-party certification body, which inspects production facilities to ensure compliance.

Verification of implemented halal standard requirements is performed in accordance with certification procedures for specific product types. This includes a certification audit, during which the halal certification body inspects all processes within the company's production facilities—from raw material procurement to packaging and storage. During or after verification, validation is often required, which involves laboratory analysis of raw materials, semi-finished, or finished products.

In the validation process of halal-certified products, the halal certification body conducts sampling and analysis of certified products or raw materials to detect non-halal ingredients. Validation involves sampling and analyzing products based on halal standard requirements. Laboratory tests can be mandatory or recommended, with the frequency and timing of mandatory analyses determined according to accreditation standard criteria, taking into account product nature, sensitivity, risk level, and other factors.

These tests can be performed using classical laboratory methods or rapid (screening) tests. Due to the fast-paced nature of production, analysis results need to be obtained as quickly as possible, making rapid methods essential for detecting certain ingredients. For example, raw materials may contain haram components such as ethanol (alcohol) found in flavorings, additives, or other raw materials. According to the requirements of halal standards OIC/SMIIC 1 and BAS 1049:2023 – Halal Food Requirements and

Measures, all products or beverages containing alcohol are strictly prohibited in accordance with Islamic regulations, even if used for cooking or filling confectionery products.

Alcohol (from the Arabic *al-kuḥl* – „kohl“)<sup>1</sup> is a type of organic compound that contains at least one hydroxyl (–OH) functional group attached to a saturated carbon atom (Patai, 1971). Alcohols range from simple compounds, such as methanol and ethanol, to more complex ones, such as sugar alcohols and cholesterol. The presence of an OH group significantly alters the properties of hydrocarbons, giving them hydrophilic characteristics. The OH group serves as a reactive site where various chemical reactions can occur<sup>2</sup>. There are many types of alcohols, including methanol, ethanol, isopropyl alcohol, butanol, propylene glycol, glycerol, erythritol, xylitol, mannitol, sorbitol, glycerol, inositol, menthol, and others. All these alcohols are used for different purposes, but only ethanol has intoxicating properties (Husaini, 2018). From the perspective of Islamic regulations, ethanol can be divided into two categories:

1. Ethanol derived from natural sources
2. Ethanol obtained through chemical synthesis

According to Islamic rulings, ethanol obtained from natural sources through fermentation and distillation is considered haram and impure (Arabic: *najis*). However, ethanol produced through chemical synthesis is not considered impure, and its use in the halal industry is permitted as long as its concentration does not cause intoxication (Alam, 2021).

### Validation of Rapid Methods in the Analysis of Food Origin and Quality

Validation is the process of verifying the validity of a process or product, as well as determining whether a specific process or product fulfils its intended purpose.

The evaluation (validation) of a method involves testing and obtaining objective evidence that the specific requirements for the intended use have been met (Regulation on the Implementation of

<sup>1</sup><https://www.sciencefriday.com/articles/the-origin-of-the-word-alcohol/>

<sup>2</sup>[https://en.wikipedia.org/wiki/Alcohol\\_\(chemistry\)#cite\\_note-4](https://en.wikipedia.org/wiki/Alcohol_(chemistry)#cite_note-4)

Analytical Methods and Interpretation of Results; Official Gazette of BiH No. 95/10).

The purpose of validation is to ensure that different data obtained from product analyses lead to consistent and high-quality results. Validation determines the reliability of a method. The simplest definition of analytical method validation is the process of demonstrating that a method serves the purpose for which it is intended. First and foremost, it is necessary to define the purpose of the method. After that, procedures are determined, i.e., experiments are planned and conducted, and their results are collected and presented as evidence of the method's validity.

**Table 1.** Overview of quality parameters for quantitative and qualitative analytical methods (Trullols et al., 2004).

Quantitative methods	Qualitative methods
Accuracy: truthfulness, precision	Sensitivity and specificity
Uncertainty	False positive and negative rates
Sensitivity and specificity	Selectivity
Selectivity	Detection limit
Range and linearity	Marginal limit
Limit of detection	Region of unreliability
Robustness	Robustness

The same procedures will not be applied to all methods-qualitative and quantitative methods are validated differently. The validation process differs for methods used to determine the main analyse in a sample versus those used to detect trace components in a complex matrix. Each method is approached individually, and an assessment is made to determine the necessary steps for proving its effectiveness (Lazarić, 2012).

The validation of analytical methods is a process that includes laboratory testing of specific analytical parameters to determine the method's reliability in relation to its intended use.

Both practice and regulations have accepted the fundamental parameters that need to be determined for quantitative and qualitative methods.

By combining the parameters presented in Table 1, a validation plan is formulated for each method.

### Enzymatic Test for Semi-Quantitative Determination of Ethanol in Products

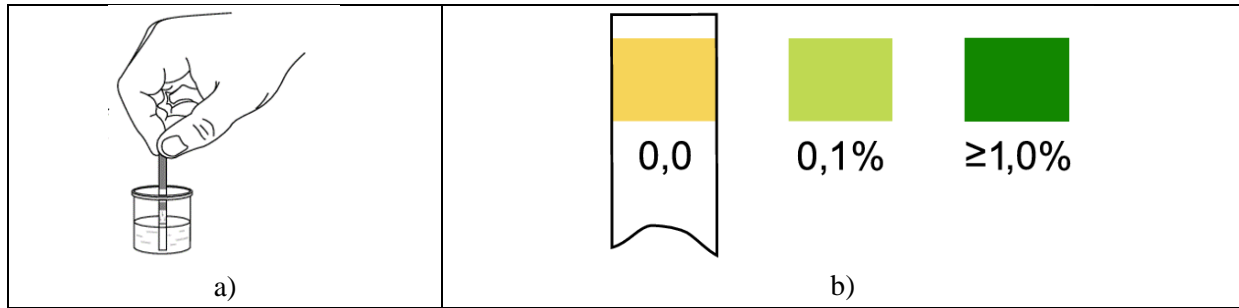
In recent years, various analytical methods have been developed to identify specific substances in products intended for human consumption. Some analytical methods aim to protect products from potential adulteration by manufacturers while simultaneously safeguarding end consumers from possible fraud in the food market (Gvozdanović et al., 2017).

Additionally, there is often a need to detect other unwanted substances in food. For this purpose, immunochromatographic and enzymatic tests can be used to detect mycotoxins (Lai et al., 2009), allergens, GMOs (Holst-Jensen, 2009), residues of veterinary drugs, the presence of ethanol alcohol residues, and similar contaminants.

Alcohol detection can be performed using an enzymatic test for the semi-quantitative determination of ethanol traces in non-alcoholic beverages, food products, and within kitchens and equipment in the food industry.

Ethanol from the sample is converted by a specific enzyme attached to the test pad. During this conversion, the colour on the pad changes proportionally to the amount of ethanol present. The test sensitivity in solution is 0.02% vol., which represents the first stage of colour change on the test. These tests also show the same sensitivity in detecting methanol, while they are less sensitive to other alcohols such as propanol, isopropanol, butanol, and isobutanol. They are not applicable for detecting higher alcohols, aldehydes, or ketones (including acetone). The analysis result is read based on the colour change on the test pad. This test is semi-quantitative and can be used for detecting alcohol (ethanol) in beverages. Additionally, it is applicable for detecting alcohol in certain food products and raw

materials, such as kefir, yogurt, flavours, colorants, and similar liquid products.



**Figure 1. a)** Sample testing process; **b)** Indicator and interpretation of the analysis results for the semi-quantitative determination of ethanol traces (adapted from the manufacturer's instructions for Xema test Alco).

### Research Method

For alcohol detection in products and samples, the commercial XEMATest Alco - Enzymatic Test for semi-quantitative determination of ethanol in food and beverages from XEMA Co. Ltd. was used.

### Materials

Materials for ethanol detection in products included 96% concentrated ethanol. The samples were prepared by diluting the 96% ethanol with distilled water according to previously designed ratios.

**Table 2.** List of raw materials and products taken for analysis and sample preparation for ethanol detection in products and samples.

No.	Materials Samples	/ Declared alcohol in the product
1.	Ethanol	96% ethanol
2.	Methanol	Methanol
3.	Non-alcoholic beer	0,0% Ethanol
4.	Non-alcoholic beer	0% Ethanol
5.	Soft malt drink	-
6.	Beer 1	5% Ethanol
7.	Beer 2	5,5% Ethanol
8.	Kefir 1	-
9.	Kefir 2	-
10.	Kefir 3	-

### Sample Preparation

For ethanol detection, nine samples with varying ethanol concentrations were prepared: 10%, 5%, 3%, 2%, 1%, 0.5%, 0.1%, 0.05%, and 0.02%. To prepare the samples with different ethanol concentrations, 96% vol. concentrated ethanol was used as a reference. The samples were prepared by diluting the concentrated ethanol according to the following ratio:

$$C_1 \cdot V_1 = C_2 \cdot V_2$$

Where:

$C_1$  – ethanol concentration in the sample,  
 $V_1$  – volume of the sample,  
 $C_2$  – ethanol concentration in the solution,  
 $V_2$  – volume of the solution.

Since concentrated ethanol with a concentration of 96% was used, the amount required for the desired ethanol content in the samples was calculated. The desired ethanol content in the samples is obtained from the previous equation as follows:

For a sample containing 10% ethanol, the calculation is as follows:

$$V = \frac{10\% \cdot 100ml}{96\%} = 10,41 \text{ ml}$$

In a 100 ml volumetric flask, 10.41 ml of 96% ethanol was pipetted and transferred, then the flask was filled to the mark with distilled water. For a sample containing 5% ethanol, the required amount is:

$$V = \frac{5\% \cdot 100ml}{96\%} = 5,20 \text{ ml}$$

In a 100 ml volumetric flask, 5.20 ml of 96% ethanol was pipetted and transferred, then the flask was filled to the mark with distilled water. For a sample containing 3% ethanol, the calculation is as follows:

$$V = \frac{3\% \cdot 100ml}{96\%} = 3,12ml$$

In a 100 ml volumetric flask, 3.12 ml of 96% ethanol was pipetted and transferred, then the flask was filled to the mark with distilled water. In the same way, the required volume was calculated for the 1%, 0.5%, 0.1%, 0.05%, and 0.02% samples, pipetted and transferred into the volumetric flask, and then filled to the mark with distilled water.

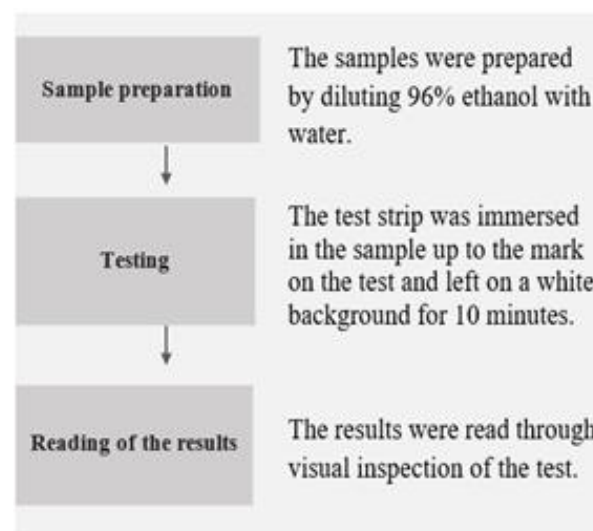
**Table 3.** List of samples prepared for ethanol detection.

No.	Sample	Ethanol Content (ml)	Water Content (ml)	Percentage of ethanol in the sample (%)
1.	Sample 0%	0	100	0
2.	Sample 0,02%.	0,0208	≈ 99,98	0,02
3.	Sample 0,05%,	0,052	≈ 99,95	0,05
4.	Sample 0,1%,	0,104	≈ 99,89	0,10
5.	Sample 0,5%,	0,52	99,48	0,50
6.	Sample 1%,	1,04	98,96	1,00
7.	Sample 2%,	2,03	97,97	2,00
8.	Sample 3%,	3,13	96,87	3,00
9.	Sample 5%,	5,20	94,80	5,00
10.	Sample 10%,	10,41	89,59	10,00

\*ND – non-declared

In addition to the prepared samples with varying ethanol content, alcohol detection was performed on finished commercial products sampled from a supermarket. Out of a total of eight sampled commercial products, six did not have alcohol declared. Kefir, a dairy food product, can contain 0.2 – 2% alcohol (ethanol) depending on the production method. Three kefirs from three different manufacturers were sampled.

Depending on the regulations in certain countries, non-alcoholic beer can contain 0 – 0.5% alcohol (ethanol). Two non-alcoholic beers and a "Kvas" product – a non-alcoholic refreshing beverage based on barley malt – were sampled for the study. In addition to the alcohol-free products, two alcoholic beers from different manufacturers were sampled, with alcohol content declared as 5% and 5.5% on their labels.



**Figure 2.** Flow diagram of ethanol detection in the solution.

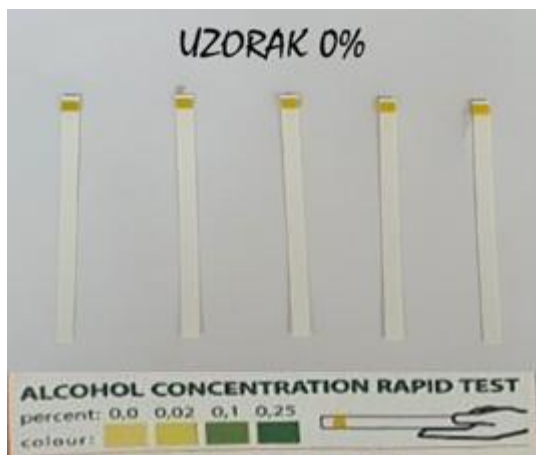
**Table 4.** List of finished commercial products used for ethanol detection.

No.	Sample	Ethanol Content (ml)	Percentage of ethanol in the sample (%)
1.	Beer		5%
2.	Beer		5,5%
3.	Non-alcoholic beer	*ND	Unknown
4.	Non-alcoholic beer	ND	Unknown
5.	Non-alcoholic refreshing beverage based on barley malt	ND	Unknown
6.	Kefir 1	ND	Unknown
7.	Kefir 2	ND	Unknown
8.	Kefir 3	ND	Unknown

**Results and Discussion**

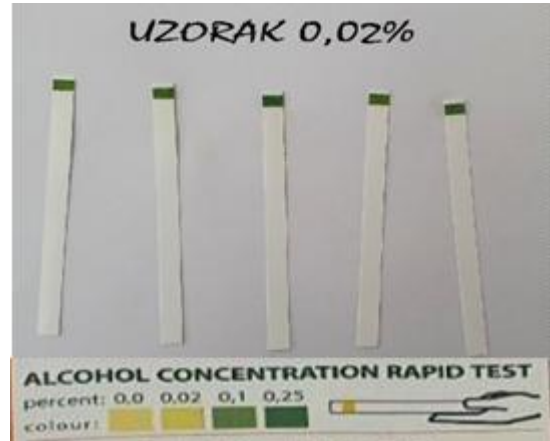
According to the manufacturer's instructions for this enzymatic test, the volumetric alcohol content in the analyzed sample can be assessed based on the color intensity ranging from light yellow to dark green. The initial color on the test pad before analysis is light yellow.

In the sample containing 0% ethanol, there was no color change on the test strip pad, indicating that the sample does not contain alcohol (Figure 3).



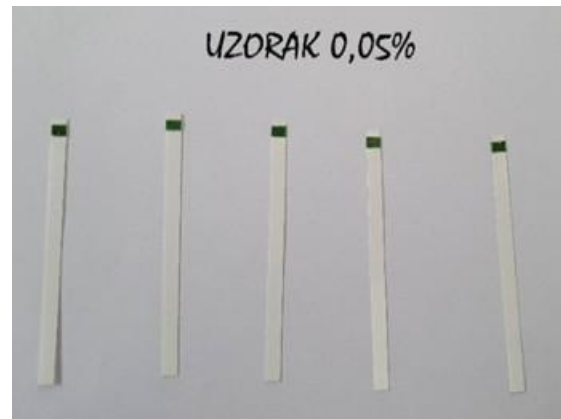
**Figure 3.** Display of results for a sample containing 0% ethanol.

On the test part of the strip of the analyzed sample containing 0.02% alcohol, a color change occurred on the pad, indicating that the sample is positive for the presence of ethanol (Figure 4). The color on the pad changed from the initial yellow to light green, indicating that the sample contains more than 0.02% alcohol.



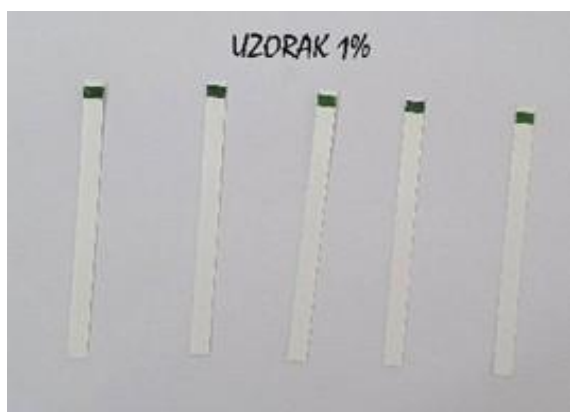
**Figure 4.** Display of results for a sample containing 0,02% ethanol.

In Figure 5, it is visible that on the test part of the strip with a sample containing 0.05% ethanol, a color change occurred on the pad, indicating that the sample contains alcohol.



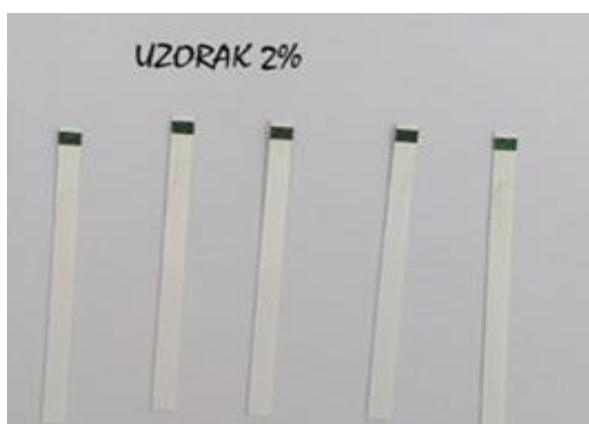
**Figure 5.** Display of results for a sample containing 0,05% ethanol.

On the test part of the strip of the analyzed sample with a content of 1% ethanol, a color change occurred on the pad, indicating that the sample is positive for the presence of ethanol.



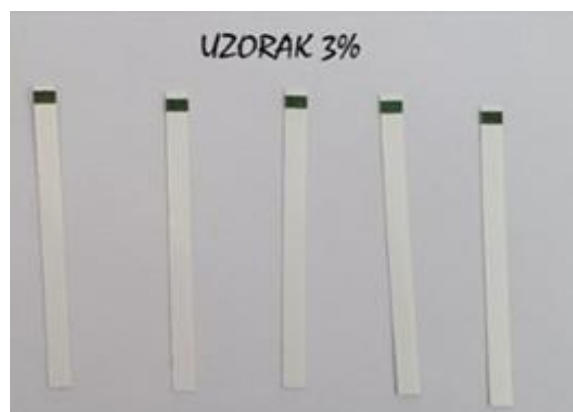
**Figure 6.** Display of results for a sample containing 1% ethanol.

On the test part of the strip with a sample containing 2% ethanol, a color change occurred on the pad, indicating that the sample is positive for the presence of ethanol.



**Figure 7.** Display of results for a sample containing 2% ethanol.

On the test part of the strip with a sample containing 3% ethanol, a color change occurred on the pad, indicating that the sample is positive for the presence of ethanol.



**Figure 8.** Display of results for a sample containing 3% ethanol.

On the test part of the strip with a sample containing 5% ethanol, a colour change occurred on the pad, indicating that the sample is positive for the presence of ethanol.

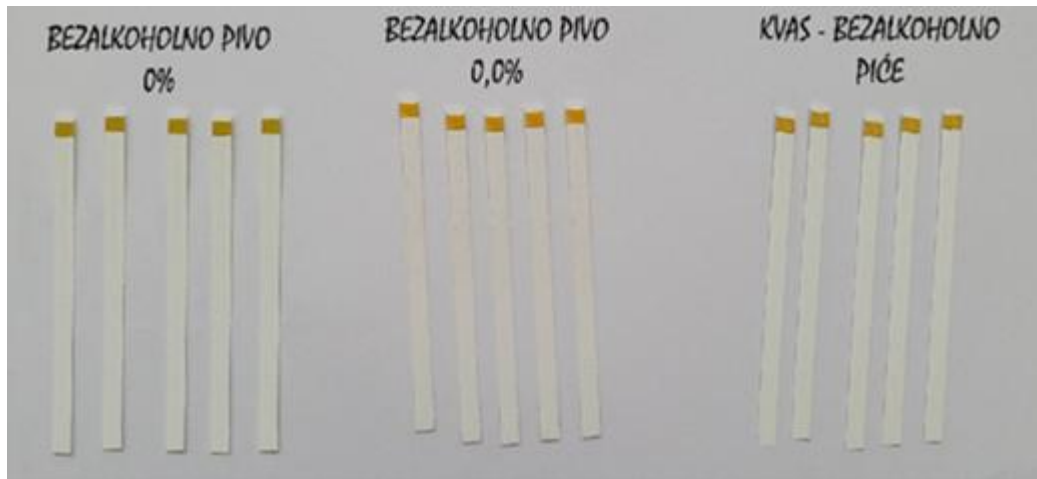


**Figure 9.** Display of results for a sample containing 5% ethanol.

On the test part of the strip with a sample containing 10% ethanol, a colour change occurred on the pad, indicating that the sample is positive for the presence of ethanol.



**Figure 10.** Display of results for a sample containing 10% ethanol.



**Figure 11.** Display of results for products with undeclared alcohol-ethanol.

**Results of the Enzymatic Test for Alcohol (Ethanol) Detection in Samples**

A total of 18 samples were analyzed, and 90 tests were conducted using the enzymatic rapid test for alcohol detection. The analyses were performed on prepared samples containing alcohol concentrations of 0%, 0.02%, 0.05%, 0.1%,

0.5%, 1%, 2%, 3%, 5%, and 10%. All tests that contained alcohol showed positive results for the presence of alcohol. The result is read by the color change on the test pad, ranging from light green to dark green. In addition to the analyses performed on the prepared samples, tests were also conducted on finished products, both those with declared alcohol content and those with no declared alcohol content.

**Table 5.** Results of the Enzymatic Test for Alcohol (Ethanol) Detection in Samples

No.	Tested Samples	Conducted Analysis No.	Analysis Results	
			Positive	Negative
1.	Sample with 0% ethanol	5	0	5
2.	Sample with 0,02% ethanol	5	5	0
3.	Sample with 0,05% ethanol	5	5	0
4.	Sample with 0,1% ethanol	5	5	0
5.	Sample with 0,5% ethanol	5	5	0
6.	Sample with 1% ethanol	5	5	0
7.	Sample with 2% ethanol	5	5	0
8.	Sample with 3% ethanol	5	5	0
9.	Sample with 5% ethanol	5	5	0
10.	Sample with 10% ethanol	5	5	0
11.	Beer	5	5	0
12.	Beer	5	5	0
13.	Non-alcoholic beer	5	0	5
14.	Non-alcoholic beer	5	0	5
15.	Non-alcoholic refreshing beverage based on barley malt	5	0	5
16.	Kefir 1	5	0	5
17.	Kefir 2	5	0	5
18.	Kefir 2	5	0	5
<b>Total number of analysis</b>		<b>90</b>	<b>55</b>	<b>35</b>

### ***Accuracy of the Enzymatic Test for Alcohol Detection***

The results of the enzymatic test were not confirmed by a reference method for alcohol detection, but by using a reference material and diluting it to different alcohol percentages in the sample.

Accuracy shows the agreement between the mean values of the obtained results and the actual values in the sample. Every tested sample containing alcohol showed a positive result in each repeated analysis, so it can be concluded that the test is accurate for alcohol detection in products.

**Table 6.** Overall representation of true positive, false positive, false negative, and true negative results for alcohol detection (adapted from: Guidelines for the validation and verification of quantitative and qualitative test methods, National Association of Testing Authorities, Australia 2012).

		Samples with different contents of genetically modified soy and corn	
		Positive	Negative
Test results	Positive	True Positive $TP=55$	False Positive $FP = 0$
	Negative	False Negative $FN= 0$	True Negative $TN = 35$

### ***The sensitivity of the enzyme test for alcohol detection***

Within the framework of qualitative analysis, sensitivity and specificity represent the ability of a test to distinguish truly positive from truly negative samples. Sensitivity is the ability of a method to correctly identify true positive samples as positive, so the sensitivity rate is the probability that for a given concentration, the tested sample will be classified as positive, given that the tested sample is already known to be positive (O'Rangers et al., 2000). Sensitivity can be calculated according to the formula:

$$Sensitivity = \frac{TP}{(TP + FN)}$$

Where:  $TP$  – True Positive results;  $FN$  – False Negative results.

The results of the experiment showed that 55 analyses yielded true positive results, and no analysis showed false negatives. By incorporating the results into the formula for determining sensitivity, the following will be obtained:

$$Sensitivity = \frac{TP}{(TP + FN)} = \frac{55}{(55 + 0)} \cdot 100 = 100\%$$

In the context of qualitative analysis, sensitivity represents the ability of the test to differentiate between truly positive and truly negative samples.

Based on the conducted analyses and calculations, it was determined that the enzymatic test for alcohol detection is highly sensitive, as a sensitivity rate of 100% was achieved.

### ***Specificity of the enzymatic test for alcohol detection***

Specificity is defined as "the ability of a method to correctly identify true negative samples as negative." The specificity rate is the probability that, for a given concentration, the method will classify the tested sample as negative, assuming that the tested sample is previously known to be negative (O'Rangers et al., 2000). Specificity can be expressed according to the following relation:

$$Specificity = \frac{TN}{(TN + FP)}$$

Where: *TN* – True Negative results; *TP* – True Positive results; *FP* – False Positive results;  
 The results of the experiment showed that 35 analyses showed true negative results, and no analysis showed false negatives. By including these results in the formula for determining specificity, we get:

$$\begin{aligned} \text{Specificity} &= \frac{TN}{(TN + FP)} = \frac{35}{(35 + 0)} \cdot 100 \\ &= 100\% \end{aligned}$$

By inserting the results into the formula for determining specificity and performing the calculation, it can be determined that the method/test is capable of accurately identifying true negative samples as negative. This confirms the effectiveness of the test in distinguishing between positive and negative samples.

#### **Determination of the false positive rate of the enzymatic alcohol detection test**

The false positive rate is the probability that a test sample known to be negative is classified as positive by the test method. The false positive rate can be expressed by the following formula (Feldsine et al., 2002):

$$\text{False Positive Rate} = \frac{FP}{(TP + FP)}$$

Where: *FP* – False Positive results; *TP* – True Positive Results;

By inserting the analysis results into the formula for determining the false positive rate, the false positive rate of the semi-quantitative alcohol-ethanol detection test in the sample will be obtained.

$$\begin{aligned} \text{False Positive Rate} &= \frac{FP}{(TP + FP)} \\ &= \frac{0}{(55 + 0)} \cdot 100 = 0\% \end{aligned}$$

Given that the false positive rate is 0%, meaning the error rate is  $\alpha < 5\%$ , it can be stated that this test does not produce false negative results for alcohol-ethanol detection.

#### **Determination of the false negative rate of the enzymatic alcohol detection test**

The false negative rate is the probability that a test sample known to be positive is classified as negative by the test method. The false negative rate can be expressed with the following formula (Feldsine et al., 2002):

$$\text{False Negative Rate} = \frac{FN}{(TP + FN)}$$

Where: *FN* – False Negative results; *TP* – True Positive results.

By including the analysis results in the formula for determining the false negative rate, the false negative rate of the semi-quantitative alcohol-ethanol detection test in the sample will be obtained.

$$\begin{aligned} \text{False Negative Rate} &= \frac{FN}{(TP + FN)} \\ &= \frac{0}{(55 + 0)} \cdot 100 = 0\% \end{aligned}$$

Out of a total of 90 conducted analyses, 55 were true positive, and 0 were false negative. By including the results in the formula for the false negative rate, the calculated value for the false negative rate was 0%, meaning the error is  $\beta < 5\%$ . Based on the analyses performed, it can be concluded that this test does not produce false negative results for ethanol detection.

During the experiment, it was determined that this enzyme test, in addition to ethanol, can also detect methanol and isopropanol, allowing the determination of the type of alcohol present in the sample or product being analysed. A drawback of this method is its non-selectivity in alcohol detection, so validation is recommended using procedures like GC-MS or another standardized method. The application of this rapid method in acidic solutions is not possible, such as in the case of alcohol presence in acetic acid.

## Conclusion

A total of 90 analyses were conducted using the rapid enzyme test for alcohol detection, with 55 true positive and 35 true negative results. The results were validated based on the detection of previously prepared samples with varying ethanol concentrations as reference material.

The enzyme tests did not show any false positive or false negative results. The calculations determined that the enzyme test for alcohol detection has 100% sensitivity and specificity. The false positive rate is 0%, meaning the error is less than 5% ( $\alpha < 5\%$ ), while the false negative rate is also 0%, with an error of  $\beta < 5\%$ .

Based on experimental data and the obtained parameters, it can be concluded that the enzyme test is accurate and reliable for detecting alcohol—ethanol in samples and commercial finished products.

The enzyme test for alcohol detection can be reliably used to detect alcohol in raw materials, semi-finished products, and non-alcoholic beverages for the detection of ethanol in halal-certified products.

The enzyme test for alcohol detection can be used to detect ethanol in raw materials, alcoholic and non-alcoholic beverages, and liquid food products, such as kefir, yogurt, and similar products that may contain ethanol.

Although it was not the focus of the study, during the experiment, it was observed that the alcohol detection test reacts positively not only to ethanol in samples but also to methanol, detecting it as well. On the other hand, the product "Alcoholic Vinegar," labelled as containing 0.5% alcohol (ethanol), could not be detected by the test. After this discovery, a smaller quantity of ethanol was added to the sample, which the test also failed to detect. Further investigation is needed to determine which type of acid, concentration, or pH value interferes with alcohol detection in acidic media.

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## Primjena brzih enzimskih testova za detekciju etanola u validaciji halal certificiranih proizvoda

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### Sažetak

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Halal kvalitet predstavlja ukupnost karakteristika proizvoda i usluga koji zadovoljavaju osnovne attribute kvaliteta, kao što su zdravstvena i higijenska ispravnost, te usklađenost sa zahtjevima halal standarda i islamskih propisa o hrani.

Halal certificiranje proizvoda provodi se proaktivno - preventivnom metodom sa namjerom prevencije miješanja ili nastanka bilo koje količine sastojaka koji mogu imati haram status. Savremeni način proizvodnje hrane nameće potrebu za primjenom brzih metoda i tehnika u analizi porijekla i kvaliteta hrane. Posebno je to izraženo u području proizvodnje halal proizvoda.

Cilj rada je bio izvršiti validaciju brzih enzimskih testova za detekciju etanola u pripremljenim uzorcima i gotovim proizvodima, te odrediti njihovu primjenjivost i pouzdanost u analizi.

Za detekciju alkohola u proizvodima i uzorcima korišten je XEMATest Alco - Enzimski test za semi-kvantitativno određivanje etanola u uzorcima proizvođača XEMA Co. Ltd.

U svrhu ovog istraživanja provedeno je 90 analiza na 18 uzoraka od kojih je 10 uzoraka pripremljeno sa različitim sadržajem etanola od 0,02% do 10%, a 8 uzoraka komercijalnih alkoholnih i bezalkolnih pića.

Brzim enzimskim testovima utvrđeno je prisustvo alkohola u uzorcima u koje je dodan alkohol, te u dva alkoholna pića na čijim deklaracijama je navedeno da sadrže 5 i 5,5% alkohola. Od svih uzoraka u 55 analiza je detektovano prisustvo etanola, a u 35 nije. Analize nisu pokazale lažno pozitivne i lažno negativne rezultate. Utvrđena osjetljivost i specifičnost enzimskog je testa 100%, a lažno pozitivna stopa od 0%, gdje je pogreška  $\alpha < 5\%$ , lažno negativna stopa od 0% i pogreška  $\beta < 5\%$ .

**Ključne riječi:** brzi testovi, detekcija, etanol, halal proizvodi.

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## JOURNAL OF HALAL QUALITY AND CERTIFICATION

### Consumer Attitudes in the Tuzla Canton Regarding Halal Nutrition

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#### ABSTRACT

Consumers today are increasingly aware of the impact of food on health and pursue dietary practices that sustain physical well-being, prevent diseases, and enhance mental health and quality of life. The aim of the research was to determine the attitudes of consumers in the Tuzla Canton regarding the impact of halal diets on reducing health risks associated with obesity and non-communicable diseases. The study employed data analysis on information collected through an anonymous questionnaire administered to respondents in the Tuzla Canton, and compared these findings with secondary data derived from relevant scientific and professional literature on the benefits of halal diets. A high percentage of the most favorable response option on the Likert scale was observed for questions regarding commitment to the consumption of halal products and dishes prepared with halal ingredients (86.3%), awareness of the health benefits of Ramadan fasting (81.6%), and the practice of Ramadan fasting (84.5%).

However, despite these high percentages, particularly concerning commitment to halal diets, the proportion of the most favorable responses for questions related to the nutritional aspects of halal diets was notably low; specifically, responses regarding monitoring nutritional information on halal products (23.3%), consuming a diverse range of halal foods while maintaining nutritional balance (11.0%), and consuming halal food in moderation (28.2%). For all three of these questions, the intermediate response option, namely “occasionally,” was frequently selected, with percentages of 60.2%, 61.0%, and 57.8%, respectively. The response to the seventh question confirmed the potential of halal diets in reducing excessive body weight and obesity, as 48.1% of respondents reported a decrease in body weight after Ramadan fasting. The respondents’ answers indicate a positive impact of halal diets on health.

The high proportion of intermediate responses for questions of a nutritional nature (nutritional balance, diversity, and moderation) indicates a need for consumer education on the nutritional aspects of halal food. Such education would contribute to establishing a stronger scientific foundation for consumers’ attitudes and experiences regarding halal food, potentially resulting in a higher percentage of respondents providing the most favorable responses to these and similar questions.

**Keywords:** *halal food, halal nutrition, health benefits, consumer*

## **Introduction**

The fast-paced modern lifestyle brings with it a rapid mode of eating, which may contribute to an increase in body weight, heart disease, cancer (particularly colon cancer), and other diet-related illnesses. The World Health Organization (WHO) identifies the leading dietary risk factors as increased body weight (body mass index > 25 kg/m<sup>2</sup>), high consumption of energy-dense foods, saturated fats, trans fats, sugar, and salt. Obesity (body mass index > 30 kg/m<sup>2</sup>) is recognized as a risk factor for numerous diseases and bodily conditions (Flegal et al., 2012; Ogden et al., 2012).

Health is a fundamental component of quality of life (QoL), which is considered the most important goal in societal development (Čanković et al., 2011). Quality of life is defined as the perception of one's position in life within the context of the culture and value system in which an individual lives, relative to his or her own goals, expectations, standards, and interests, while health-related quality of life (HRQoL) represents the subjective evaluation of health and well-being. Due to the undeniable link between diet and health, the concept of food-related quality of life (FRQoL) has been introduced to assess the impact of diet on HRQoL (Čanković et al., 2011; Sitlinger and Zafar, 2018; Oliviera et al., 2021).

In addition to diet, religious practices such as fasting and prayer may also have a positive impact on HRQoL, contributing not only to physical but also to mental health because of the spiritual dimension of religion. This conclusion is supported by 41 out of 64 studies published between 2001 and 2012 (Tan et al., 2013).

The fundamental principle of halal nutrition is to consume halal food frequently, in moderation, and with variety, with its roots in Islam. In accordance with this principle, halal nutrition aligns with the tenets of modern balanced diets as well as with the principles of integrative or holistic medicine. Consequently, halal nutrition is emerging as a new, scientifically grounded health paradigm that is increasingly attracting the

attention of non-Muslims, consumers, and researchers (Zildžić et al., 2023; Latif, 2018).

The aim of this paper is to present the attitudes of consumers in the Tuzla Canton regarding halal nutrition, with a particular emphasis on the perceived impact of this diet on health. The research objectives include analyzing existing knowledge about the relationship between diet and health, determining consumers' attitudes toward halal nutrition, and examining differences in perception among various demographic groups. The research hypothesis posits that although consumers generally exhibit a positive attitude toward halal nutrition, a lack of specific information about its nutritional aspects constitutes an obstacle to fully realizing its potential health benefits.

## **Halal Nutrition and Health**

The word "halal" originates from Arabic and means "permissible." This term is used to denote what is allowed for Muslims according to Islamic regulations. The primary sources of halal guidelines are the Quran, the holy book of Muslims, and the Sunnah, which encompasses everything that the Prophet Muhammad (peace be upon him) said, did, or approved (Jašić et al., 2022). When it comes to food, halal implies that everything is permitted except for what is explicitly forbidden in the Quran, the Sunnah, or by consensus among Islamic scholars. The process of producing and preparing halal food must meet all legal and hygienic standards. This concept ensures the safety of the product, thereby building consumer trust, enhancing the firm's reputation, and ensuring economic sustainability.

Nutrition involves the intake of food to satisfy the body's dietary needs, and halal nutrition can be defined as the selection of health-safe food items with halal status, their preparation in a halal manner, and the moderate consumption of a varied diet along with the intake of an adequate amount of water (Jašić et al., 2022). Halal nutrition is a global phenomenon that transcends religious boundaries and is becoming increasingly interesting to non-Muslim

consumers due to its strong association with food safety, hygiene, and its impact on health.

According to the WHO, health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity (WHO, 2020).

Numerous diseases are caused by poor nutrition. An unhealthy diet is associated with a weakened immune system, viral and bacterial infections, as well as deficiency diseases such as scurvy and pellagra (Thompson & Manore, 2018). Diet should be balanced and rich in all essential nutrients; both deficiencies and excesses of certain nutrients can subtly undermine health.

Among the ten most common causes of death in the United States—and globally—four are linked to food and individual dietary habits: heart disease, stroke, cancer, and diabetes. There is also a growing prevalence of insulin resistance, high blood pressure, and similar conditions (Brown, 2017). Obesity is considered the main risk factor for all these diseases (Thompson & Manore, 2018). Over the past four decades, obesity rates among adults and children have dramatically increased (Flegal et al., 2012; Ogden et al., 2012). Data show that mortality rates are highest among adults with excessive body weight relative to their height. BMI ranges are used to classify body mass into categories such as undernutrition, normal weight, overweight, and obesity (Brown, 2017).

Some of the causes of excessive body mass include genetic traits, high intake of added sugars, poverty and low levels of education, lack of sleep, exposure to PCBs (polychlorinated biphenyls) during pregnancy and early childhood, cessation of smoking, and medications (Brown, 2017).

When considering the onset of diseases such as hypertension, stroke, heart disease, gallbladder disease, type 2 diabetes, osteoarthritis, and certain cancers, common risk factors include excessive body mass or obesity, unhealthy diet, insufficient physical activity, smoking, genetic predispositions, stress, and changes in hormonal status (Brown, 2017).

Halal nutrition encompasses food items that have been scientifically confirmed to be beneficial to human health. Forbidden foods (haram) can be detrimental to health and may cause diseases, as is the case with GMO foods that can have unpredictable consequences on health. In addition to the selection of food items, it is important to pay attention to the quantity consumed and the manner of consumption. Excessive intake—even of halal food—can jeopardize health.

### **Fasting and Health**

Fasting during the month of Ramadan involves complete abstinence from food and drink from dawn until sunset. Numerous studies have confirmed the health benefits of fasting. Many popular dietary regimens are based on this or a similar principle, incorporating long periods without food intake to allow the body to rest and regenerate.

Fasting triggers the process of autophagy, a biological mechanism that occurs within the cells and serves as a means of self-regulation and cleansing. This process involves the breakdown and recycling of damaged or unnecessary cellular components to maintain cellular functionality and homeostasis. Fasting represents a complex therapeutic approach that has a significant impact on cardiometabolic parameters, the immune system, the gut microbiome, and circadian rhythms, thereby affecting the entire organism (Glick et al., 2010). Fasting can have a substantial effect on insulin resistance, weight loss, and the management of obesity.

### **Recommendations of Halal Nutrition**

The Quran and the Sunnah repeatedly emphasize the prohibition of excess in food and drink, and the importance of moderate consumption is clearly underscored by the recommendations of the WHO. The first piece of advice that can be offered by almost all nutritionists and physicians for reducing body weight is: “a lower caloric intake—that is, less food—will lead to weight loss,” which is also the simplest solution

available. Halal nutrition fully aligns with the recommendations of contemporary nutrition and, in many ways, even surpasses them due to its holistic approach to the health and well-being of both the individual and the community. Some of the fundamental principles of halal nutrition include:

- **Do not overindulge in food** - “Eat and drink, but do not be excessive. Indeed, Allah does not like those who commit excess.” (Al-A’raf 31). Every substance a person ingests can serve as both poison and remedy, depending on the amount consumed. It is also well known that the body digests smaller quantities of food more easily and efficiently. Recent research has found that individuals who reduce their caloric intake by 30% tend to live longer and may avoid the development of certain age-related diseases (Saeed, 2022).
- **Always consume food that is pure – tayyib** - “O mankind, eat from that which is on earth [that is] lawful and good...” (Al-Baqarah 168). This primarily means that food should not contain anything that could cause immediate or long-term harm to the body, including any type of contamination (chemical, physical, or biological). Among all these potential impurities, food can be protected by adhering to halal quality standards.
- **Always eat food that is nutritionally rich** - The food recommended in the Quran and the Sunnah is anti-carcinogenic, prevents the onset of diabetes, possesses anti-inflammatory properties, protects the liver, has analgesic effects, and aids in the recovery of the body (Saeed, 2022).
- **Eat a varied diet** - A monotonous diet can lead to various problems, as it may not supply the body with all the necessary nutrients (Ibn Kajjim).
- **Combine foods properly during meals** - It is important that meals consist of foods that complement each other nutritionally (Ibn Kajjim, 2020; Ayad, 2012).
- **Drink water at intervals** - Drinking water in intervals quenches thirst more completely and efficiently, as the water gradually enters

the stomach and helps preserve its warmth against sudden cooling (Ibn Kajjim, 2020).

- **Avoid consuming food you do not like** - If a person dislikes a particular type of food, they should refrain from eating it—even if it is permissible or even healthy. Forcing oneself to eat food one dislikes can have harmful consequences, particularly for mental health (Ibn Kajjim, 2020).
- **Patients should not be forced to eat** - If a patient is compelled to eat or drink, their body will focus on digesting the food, which may interfere with the process of disease elimination. It is advisable to offer the patient nutritionally rich yet light food, such as apple-based beverages, rose water, or aromatic chicken soup, and to do so in limited quantities (Ibn Kajjim, 2020).

## Methods

This study employed the analysis of primary data collected through an anonymous questionnaire, as well as secondary data from relevant literature by authors who have investigated similar topics. The research included a total of 206 respondents. The participants were adult individuals of both genders, aged between 30 and 60 years, from the Tuzla Canton area.

## Materials

In this paper, a section of a larger questionnaire consisting of 46 questions is presented, with the analyzed and discussed responses pertaining to seven key questions related to consumers' attitudes and preferences regarding halal food. The questionnaire was closed-ended, self-constructed, and designed according to the specific needs of a broader study. The total number of respondents was 206, with a random sample selected from the Tuzla Canton. The respondents were aged between 30 and 60, which enabled the collection of representative data on consumer attitudes. The survey was distributed online, and Microsoft Excel was used for the analysis of the collected data.

## Result

**Table 1.** Comprehensive Overview of Respondents' Answers

1. Do you pay attention to the daily consumption of halal products and meals prepared from halal ingredients?		
1)	No	9,8 %
2)	It doesn't matter to me	3,9 %
3)	Yes	86,3 %
2. How often do you monitor the nutritional information on (halal) products?		
1)	Never	16,5 %
2)	Occasionally	60,2 %
3)	Regularly	23,3 %
3. I consume different types of halal food while ensuring their nutritional balance.		
1)	I do not pay attention	27,7 %
2)	Sometimes	61,2 %
3)	Always	11,2 %
4. When consuming halal food, I make sure not to overeat.		
1)	I do not pay attention	14,1 %
2)	Sometimes	57,8 %
3)	Always	28,2 %
5. How familiar are you with the health benefits of Ramadan fasting?		
1)	Not at all	1,5 %
2)	Partially	17 %
3)	Well	81,6 %
6. Do you fast during the month of Ramadan?		
1)	Never	6 %
2)	Occasionally	8,3 %
3)	Regularly	84,5 %
7. After the month of Ramadan, my body weight has:		
1)	Increased	8,7 %
2)	Remained the same	43,2 %
3)	Decreased	48,1 %

## Discussion

A high percentage of the most favorable option among the three offered responses on the Likert scale for seven questions was recorded for questions 1, 5, and 6, which pertain to:

- commitment to the consumption of halal products and meals prepared from halal ingredients (86.3%),
- awareness of the health benefits of Ramadan fasting (81.6%), and
- practicing Ramadan fasting (84.5%).

The reason for the high percentage of respondents who adhere to a halal diet, observe Ramadan fasting, and are familiar with its benefits lies in the demographic composition of the surveyed area, where the majority of the population adheres to the Islamic faith. Additionally, the survey was conducted immediately after the conclusion of Ramadan.

However, despite these high percentages, particularly concerning the commitment to halal nutrition, the relatively low percentage of the most favorable responses related to the nutritional aspects of halal food was somewhat surprising. These include questions regarding:

- monitoring nutritional information on (halal) products (23.3%),
- consuming various types of halal food while ensuring nutritional balance (11.0%), and
- consuming halal food while being mindful of not overeating (28.2%).

For all three of these questions, the intermediate response options, "occasionally" or "sometimes" (often chosen by undecided and uncertain respondents in surveys), were also high and close in percentage: 60.2%, 61.0%, and 57.8%, respectively. The fact that only 23.3% of respondents regularly check nutritional information on (halal) products (16.5% never, 60.2% occasionally) can be attributed to consumer habits, which have been confirmed by numerous studies. These studies indicate that although consumers are aware that nutritional labeling can aid in making healthier food choices, they do not pay much attention to reading nutritional labels in general. Additionally, consumers prefer shorter and more concise information on packaging due to "information overload" and "time pressure" when making purchasing decisions. For example, in France in 2004, out of 870 consumers, only 22% were actively interested in nutritional information, 41% were occasionally interested, 29% had little interest, and 8% were uninterested. In the Una-Sana Canton in 2014, among 300 respondents, 21.7% always and 28.7% mostly read product labels, while the other half rarely (34.3%) or

never (15.3%) did so. In Croatia, 60% of the population never or rarely reads nutritional labels, while only 39% read them regularly, mainly, or only upon the first purchase. Those who read nutritional labels mostly do so out of curiosity (35%) or a desire for a "healthy" diet (30%). Furthermore, 59% of respondents stated that the main reasons for not reading nutritional labels were a lack of interest and a lack of responsibility for food purchases (Muhamedbegović et al., 2018; Temple et al., 2014).

Additionally, considering responses about nutritional balance and moderation in food intake, a certain level of concern arises. As many as 61% of respondents stated that they sometimes pay attention to food balance, while only 11% do so regularly, and 28% do not consider it at all.

Regarding halal food consumption, only 28.2% of respondents consistently ensure they do not overeat, while 14.1% do not pay attention to this aspect, and 57.8% sometimes do.

These responses indicate that only a small number of respondents strictly and confidently adhere to the fundamental principles of halal nutrition: consuming halal food frequently, moderately, and diversely. This is also inconsistent with the principles of modern balanced nutrition.

The response to the question about changes in body weight after Ramadan fasting confirmed the potential of halal nutrition in reducing excessive body weight and obesity (which affects 10% of the 206 respondents). Specifically, 48.1% of respondents reported weight loss after Ramadan fasting. Fasting has multiple beneficial effects on the human body, one of which is providing a break from constant food intake, thereby promoting fat utilization and leading to weight reduction. Fasting is a means of maintaining health and a healthy body weight, especially when combined with prayer. This religious practice can have a positive impact not only on physical health but also on mental well-being due to its spiritual dimension. This was confirmed by

41 out of 64 studies published between 2001 and 2012 (Tan et al., 2013).

Therefore, the aforementioned percentage of responses is highly valuable as further evidence of the positive impact of halal nutrition on health, demonstrating that Ramadan fasting can serve as a strategy for weight management.

An integral part of this strategy should be education on the principles of halal nutrition—consuming halal food frequently, moderately, and diversely—as well as awareness of eating speed. Modern consumers increasingly consume food on the go, and numerous studies have confirmed that slow eating can maximize satiety, reduce energy intake per meal, and serve as a useful preventive measure against obesity and diabetes through weight management (Khan, 2024).

## **Conclusion**

The research results indicate that consumers in the Tuzla Canton generally hold a positive attitude towards the consumption of halal food. This is evidenced by the high percentage of respondents who deliberately choose halal products and meals prepared from halal ingredients, as well as by the high level of awareness regarding the health benefits of Ramadan fasting and regular fasting practices.

At the same time, the results show that regarding nutritional aspects—such as monitoring nutritional information on products, consuming a varied and balanced diet, and controlling food intake—the majority of respondents provide moderate responses. This suggests a lack of information or a less rigorous application of nutritional guidelines. It is also noteworthy that a significant proportion of respondents reported a reduction in body weight following the month of Ramadan, which implies a certain potential of halal food in improving health status, while simultaneously emphasizing the need for further education on nutritional principles.

Therefore, it can be concluded that although consumers generally exhibit a positive attitude towards halal food, there remains room for improvement through targeted education on nutritional aspects. Such an approach would ensure a deeper understanding and more effective application of dietary guidelines, potentially further enhancing health outcomes.

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## Stavovi potrošača u Tuzlanskom kantonu o halal prehrani

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### SAŽETAK

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Potrošači danas sve više shvataju utjecaj hrane na zdravlje i teže prehrani koja ih može održati fizički zdravim, spriječiti bolesti te poboljšati njihovo mentalno stanje i kvalitetu života. Cilj istraživanja bio je utvrditi stavove potrošača na Tuzlanskom kantonu o utjecaju halal prehrane na smanjenje zdravstvenih rizika od gojaznosti i nezaraznih bolesti. U radu je korištena metoda analize podataka prikupljenih putem anonimnog popunjavanja upitnika ispitanika u Tuzlanskom kantonu i komparacija sa sekundarnim podacima iz relevantne naučne i stručne literature autora koji su istraživali prednosti halal prehrane. Visok procenat najpovoljnije opcije od tri ponuđena odgovora po Likertovoj skali zabilježen je za pitanja o posvećenosti konzumaciji halal proizvoda i jela pripremljenih od halal sirovina (86,3%), poznavanju benefita ramazanskog posta za zdravlje (81,6%) te prakticiranju ramazanskog posta (84,5%).

Međutim, s obzirom na ove visoke procenete, posebno za odgovor o posvećenosti halal prehrani, pomalo je iznenađujući nizak procenat najpovoljnijih odgovora dobijen za pitanja vezana za nutritivni aspekt halal prehrane, a to su pitanja o praćenju nutritivnih informacija na halal proizvodima (23,3%), konzumiranju raznovrsne halal hrane vodeći računa o nutritivnoj izbalansiranosti (11,0%) te konzumiranju halal hrane vodeći računa da se ne pretjeruje sa unosom hrane (28,2%). Kod sva tri ova pitanja srednja ponuđena opcija odgovora „povremeno“ odnosno „ponekad“ bila je visoka: 60,2%, 61,0% i 57,8%. Odgovor na sedmo pitanje potvrdio je potencijal halal prehrane na smanjenje prekomjerne tjelesne mase i gojaznosti, jer je 48,1% ispitanika navelo da im se tjelesna masa smanjila nakon ramazanskog posta. Odgovori ispitanika indiciraju pozitivan utjecaj halal prehrane na zdravlje.

Visok procenat srednjih ponuđenih opcijskih odgovora tipa „povremeni“ ili „ponekad“ za pitanja nutricionističkog karaktera (nutritivna izbalansiranost, raznovrsnost i umjerenost) pokazuje potrebu za edukacijom potrošača o nutritivnom aspektu halal hrane. Ova edukacija bi pomogla uspostavljanju jačeg naučnog temelja za njihove stavove i iskustva u vezi sa halal hranom, što može dovesti do većeg procenta ispitanika koji daju najpovoljnije odgovore na ova i slična pitanja.

**Ključne riječi:** *halal hrana, halal ishrana, zdravstvene koristi, potrošači*

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## JOURNAL OF HALAL QUALITY AND CERTIFICATION

### Sharia Legal Treatment of Fruits and Vegetables Grown Using Animal-Based Organic Fertilizer

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Review paper



#### ABSTRACT

The topic of the Sharia legal treatment of fruits and vegetables grown using organic fertilizers of animal origin encompasses a significant aspect of Islamic law, considering the impact of these practices on food safety and hygiene standards. Organic fertilizers, including compost, manure, and dried blood, play a crucial role in improving soil fertility and product quality. The use of dried blood as fertilizer is a subject of particular discussion among Sharia scholars, as it is often considered impure, and its application depends on the source and type of animals.

The Sharia treatment of animals whose meat, milk, and eggs serve as sources of nutrients also requires careful consideration. The right to food and hygiene is closely linked to the type of animals, their feeding, and farming methods. Through an analysis of these elements, we explore how Sharia principles apply to organic products and their impact on practices and legal norms in modern agriculture.

**Keywords:** *Sharia law, organic fertilizers, fruits and vegetables, dried blood, fermentation, jalalah (coprophagous animals), transformation.*

#### Introduction

Organic fertilization is a key factor in increasing the fertility of agricultural land and reducing environmental pollution caused by excessive use of mineral (chemical) fertilizers. Recycling organic waste plays a crucial role in providing the necessary amounts of organic fertilizer to maintain soil fertility.

Organic matter significantly influences the physical, chemical, and biological properties of soil. It is essential for soil aggregate stability and constitutes approximately 50% of the soil's

cation exchange capacity, directly affecting soil acidity and its ability to retain nutrients. Additionally, organic matter enhances soil fertility by releasing nutrients during decomposition, providing energy and nutrients for microorganisms. This process increases biological activity in the root zone, where essential functions for plant health take place. Furthermore, organic matter acts as a natural soil enhancer, significantly improving the soil's physical properties.

In modern agriculture, organic fertilization is particularly important for sandy and depleted

soils, as it ensures balanced plant nutrition throughout all growth stages. Besides reducing the need for mineral fertilizers—whose efficiency often does not exceed 60%—organic matter helps retain nutrients under conditions of intensive irrigation. Its ability to adsorb macro and microelements ensures that nutrients remain consistently available to plants in the root zone.

However, some farmers use solid waste from sewage systems or municipal waste as organic fertilizer, which can be problematic due to the presence of heavy metals. These metals can accumulate in the soil, potentially leading to harmful consequences for the soil, plants, and animals. Therefore, the use of such materials must be based on a careful assessment of the specific conditions for each type of waste, soil, and crop, rather than on general rules.

The Shariah-legal aspect in the context of different types of fertilizers encompasses ethical, environmental, and legal norms related to the use of fertilizers in agriculture, in accordance with the principles of Islamic law (Shariah). It can be said that the Shariah-legal aspect of using various types of fertilizers relies on several key principles, such as the preservation of nature, the prohibition of harmful or unethical materials, and concern for human health. Any type of fertilizer that is harmful to nature, human health, or contains haram substances could be problematic in the Shariah context.

### **Definition of Organic Fertilizer and Its Importance in Modern Agriculture**

Organic fertilizers are the decomposed remains of living organisms of plant or animal origin. They are added to the soil in a form that plants and trees can absorb through their roots. These fertilizers contain essential nutrients that help improve the physical and chemical properties of the soil and are considered one of the best types of fertilizers.

### **The Current State of Organic Agriculture Worldwide**

Organic agriculture is becoming an increasingly important segment of the global agricultural industry, not only in developed countries but also in many regions where its popularity is rapidly growing. Statistical data from various countries provide a clear picture of the expansion of this sustainable approach to farming.

For example, in Germany, despite pressures from large agrochemical companies, there are around 80,000 farms engaged in organic production. The area under organic cultivation currently accounts for about 2% of the total agricultural land. In Switzerland, the share of agricultural land under organic farming has reached an impressive 7%, with a particular emphasis on certain cantonal areas. In Austria, around 20,000 farms represent approximately 10% of the total agricultural land, while in regions like Salzburg, the share of organic farming has risen to as much as 50%.

Similar trends are observed in Nordic countries. In Sweden and Finland, the share of agricultural land under organic farming is also around 7%, which is comparable to Switzerland. Italy has seen a significant increase in the number of organic farms, rising from 18,000 to 30,000 in the past two years, demonstrating an accelerated shift toward more sustainable agriculture.

On the African continent, organic farming is also gaining momentum. In Uganda, programs for organic cotton production were introduced, starting with a small number of farms but expanding to around 7,000 farms currently participating in these initiatives. Meanwhile, in Mexico, there are about 10,000 organic farms producing food mainly for export, reflecting the global demand for organically grown products.

In 2019, organic plant production in the Republic of Serbia covered a total area of 21,264 hectares, marking an increase of 10.44% compared to 2018. Of this area, 15,915 hectares were arable land, while meadows and pastures occupied

5,350 hectares. These figures do not include areas used for collecting wild organic berries, mushrooms, and medicinal herbs, as Serbia has not yet established an official methodology for obtaining reliable data on the total area where these wild plant species are gathered from natural habitats.

These data clearly indicate the global rise in interest in organic agriculture, which not only contributes to environmental preservation but also meets the growing consumer demand for eco-friendly products.

### **Production of Organic Fertilizers Production of Organic Fertilizers from Animal By-Products**

Animal by-products are among the highest-quality and most well-known types of organic fertilizers. They are most commonly derived from the manure of herbivorous animals such as horses, cows, rabbits, and poultry after it has sufficiently decomposed. This type of fertilizer is very popular and widely available in garden centers and agricultural advisory services.

Farmers who raise animals themselves can obtain fertilizer directly from their livestock manure. It is important to emphasize that manure must ferment in the soil for at least six months to become fully suitable for use. This process allows nutrients to be optimally distributed in the soil without harmful effects on plants.

In addition to manure, organic fertilizers can also be derived from other animal by-products. Examples include bones, blood, and feathers from commercially slaughtered animals. Additionally, fish emulsion, rich in nutrients from shellfish and marine organisms, is considered one of the most valuable organic fertilizers, particularly due to its high mineral content.

### **Production of Organic Fertilizers from Plant By-Products**

Plant-based fertilizers are extremely easy to produce and ideal for home use. The most

commonly used plant-based fertilizer is compost, which is created through the natural decomposition of plant residues such as grass clippings, leaves, vegetable scraps, and other similar materials.

The composting process involves breaking down plant materials into nutrients that plants can easily absorb. This method of fertilizer production is environmentally friendly and helps recycle natural resources, contributing to sustainable agriculture and environmental conservation.

The production of organic fertilizers from both animal and plant by-products ensures natural and effective soil enrichment, supporting the growth of healthy, high-quality plants without the use of synthetic chemicals.

### **Types of Organic Fertilizers**

Organic fertilizers are a key element of sustainable agriculture, as they enable the natural enrichment of soil with nutrients, improving its fertility and structure. There are several types of organic fertilizers, each with specific characteristics and applications depending on the soil type and the crops being grown.

#### **Manure**

Manure is one of the oldest and most commonly used types of fertilizer in agriculture. It consists of the feces of livestock and other domestic animals, and its application helps significantly improve soil fertility. This type of fertilizer contributes to increased yields and improved quality of agricultural products. The advantage of manure lies in its availability and natural components, making it particularly suitable for environmentally friendly farming.

The chemical composition of manure varies depending on the type of animal, their age, diet, and the method of manure collection and storage. The use of this type of fertilizer requires careful dosing based on the characteristics of the soil and the crops being grown on it.

## **Green manure**

Green manure is a specific type of organic fertilizer used during crop rotation, especially when growing plants from the legume family. Its main advantage is the ability to enrich the soil with nitrogen, which plants can easily absorb. Green manure helps remove plant residues from the soil, improves its structure, and increases its nutrient content.

## **Fertilizer Supplement (Horse Manure)**

Horse manure is a specific type of organic fertilizer primarily used for orchards. Compared to regular manure, it is richer in nutrients such as nitrogen, phosphorus, and potassium. This type of fertilizer improves soil fertility and contributes to the growth of healthy, high-yielding fruit crops.

## **Poultry Manure Fertilizer**

With the growth of poultry farms for meat production and egg laying, a significant amount of poultry waste is accumulated, which is used as a high-quality organic fertilizer. However, this waste requires special treatment to prevent environmental pollution with unpleasant odors and disease risks.

1. **Broiler Chicken Manure:** During broiler chicken farming, wheat straw or wood shavings are used as bedding, which lines the floor of the barn or farm to create better conditions and provide a dry and clean environment for the chickens. This bedding efficiently absorbs the wet droppings of the chickens. After approximately two months, the bedding is collected along with the droppings and used as a nitrogen-rich fertilizer. This fertilizer significantly improves soil fertility and promotes plant growth due to its high nutrient content.
2. **Layer Hen Manure:** The manure from layer hens is collected daily using conveyor belts. However, this manure is known for its unpleasant odor and can become a breeding

ground for flies. If left outdoors, it retains high moisture, which can trigger anaerobic decomposition and further exacerbate odor problems. To address these challenges, some farmers use specialized drying units that utilize warm air to dry the manure. The dried manure is then ground and packaged, reducing the odor and ensuring better application in agriculture.

The use of poultry manure fertilizer offers significant benefits for sustainable agriculture, improving soil quality and reducing the need for synthetic chemical fertilizers.

## **Industrial Organic Fertilizer**

Industrial organic fertilizer is the result of a combination of organic and mineral fertilizers, with additives such as nitrogen, phosphorus, and carbonates. This type of fertilizer helps maintain soil moisture, reduces nutrient leaching, and improves soil structure. Additionally, it contributes to maintaining a healthy soil ecosystem, allowing plants to better absorb nutrients.

## **Natural Organic Fertilizer**

Natural organic fertilizer consists of a mixture of animal and plant residues, and sometimes includes natural additives such as sulfur, dolomite, and phosphorus. Unlike other organic fertilizers, this type does not contain additional mineral components, making it particularly suitable for organic farming. Its application avoids the negative effects that may arise from the excessive use of chemical fertilizers.

## **Biogas Fertilizer**

Biogas fertilizer is a lesser-known but highly beneficial type of organic fertilizer. It is produced as a by-product during the fermentation of organic materials, a process that creates biogas—a sustainable source of energy. The fermentation residues contain a high level of nutrients and organic substances, including plant hormones,

making it one of the richest natural sources of nutrients for plants. This type of fertilizer improves the physical, chemical, and biological properties of the soil, contributing to its fertility and productive capacity.

### **Municipal Waste Fertilizer**

This represents one of the most efficient ways to economically utilize waste. During this process, inorganic materials are carefully removed, while organic materials undergo fermentation to produce high-quality organic fertilizer.

### **Buddrit Fertilizer**

This type of fertilizer is obtained by collecting waste from toilets, which is then placed in open pools. In these pools, the waste is mixed with fine gypsum or sulfuric acid to stabilize ammonia. After the mixing process, the material is left to dry and harden, then crushed to prepare it for use as fertilizer.

### **Sludge Fertilizer**

In wastewater treatment plants, where water is treated for reuse, solid matter is separated in sedimentation tanks. This solid matter is then pumped into dryers, where it is mixed with cement or fine lime. This mixture is left to dry in the air for about three months, after which it is crushed and packaged for use as organic fertilizer. In plants with biogas units, the sludge undergoes anaerobic digestion to produce gas. After this process, the sludge is passed through centrifugal units to separate water, and the dried residue is used as high-quality organic fertilizer.

The use of various types of organic fertilizers enables a sustainable approach to agriculture, enriching the soil with natural ingredients and improving the quality of agricultural products without negative environmental impacts.

## **Overview of Shariah Regulations Regarding Food, Cleanliness, and Safety**

Every day, interest grows in the Shariah stance on fruits and vegetables imported from different parts of the world, where various types of mixed fertilizers are used to speed up production, preserve quality, and increase yields and volumes. Among these fertilizers are pig manure (fertilizer), which can be used in liquid form as an additive to industrial fertilizers, or in solid form. The question arises whether this process affects the plants produced, such as fruits or vegetables.

It is also being considered whether we should avoid purchasing agricultural products grown on unreliable lands. These and similar issues raise important ethical and health considerations that require a thorough understanding of Shariah principles and norms.

### **Shariah Legal Stance on the Purity and Impurity of Organic Fertilizers**

Shariah scholars are unanimous in the view that organic fertilizers derived from the excrement of animals whose meat is not permissible to eat are impure. Most scholars also consider fertilizers obtained from the excrement of birds, such as carnivorous birds, whose meat is not permissible to consume, to be impure. However, it is important to note that Imam Abu Hanifa and Imam Abu Yusuf hold a different opinion, considering fertilizers obtained from bird excrement to be pure.

When it comes to fertilizers obtained from the excrement of animals whose meat is permissible to eat, there are two different approaches among Islamic scholars.

Proponents of the first tendency, including Imam Malik, Ahmad bin Hanbal, Zufar, and one narration from Imam Muhammad, prominent jurists of the Hanafi tradition, believe that such fertilizers are pure, regardless of whether they come from birds or other animals. This view is also upheld by some Shafi'i scholars, as

mentioned by Imam al-Nawawi in his work *Al-Rawdah*.

Malikis condition the purity of fertilizers derived from animals whose meat is permissible to eat, emphasizing that these animals must not be fed impure substances, i.e., what is prohibited in Islam. If they eat impure substances, their excrement is also considered impure according to this view.

Adherents of the second tendency, including Hanafi scholars other than Zufar and Muhammad, Shafi'i scholars, and one narration from Ahmad, consider the excrement of all animals, whether edible or not, as well as the excrement of birds, to be impure.

However, it is important to note that Hanafi scholars make an exception to this rule when it comes to the excrement of birds whose meat is permissible to eat, and they consider it pure.

### **Shariah Legal Stance on the Use of Impure Fertilizer and the Consumption of Fruits Grown with It**

Among Islamic scholars, there are two different tendencies when it comes to the use of impure water for irrigating plants or using impurities, such as excrement and other impurities, for fertilizing the soil.

#### **First Opinion:**

The majority of scholars from the Hanafi, Maliki, and Shafi'i schools of thought believe that there is no obstacle in using impure fertilizers for growing plants, whether they come from the excrement of edible or non-edible animals, human excrement, or the remains of dead animals. According to their opinion, the fruits that grow from such soil remain pure and permissible for consumption. The impurities used in fertilizing the soil do not affect the fruits and crops, as they transform into healthy and pure food during the absorption process. Furthermore, there is no evidence of a visible effect of the

impurities on the fruits, either in terms of color, smell, or taste.

Prominent Hanafi scholar Ibn Abidin states in his work *Hashiya*: "According to the opinion of the majority of scholars, plants that are irrigated with impure liquids are neither prohibited nor disliked." (Ibn Abidin, 2007)

Maliki scholar Al-Harshi says: "And what is pure: the crop if watered with dirty water... Perhaps this refers to crops that have come into contact with impurities... It was also previously mentioned that Ibn Qasim allowed watering crops with dirty water, indicating that it is pure, because if it had become impure, he would not have allowed any of this." (Al-Harshi, 1997)

Imam Nawawi also states: "It is permissible to fertilize the soil with impure excrement... The correct opinion is that it is allowed, though disliked." (Imam Nawawi, 1999)

Imam Nawawi further mentions: "It is permissible to fertilize the soil with impure excrement... Imam al-Haramayn said that no one has prohibited it, and in the words of Es-Sajidaniya, the contrary opinion is mentioned, but the correct view is that it is permissible, with dislike." (Imam Nawawi, 1999)

Ibn Hazm says: "Excrement, secretions, urine, water, and earth – all of these in the palm tree become leaves and dates. At that moment, none of these is excrement, earth, or water, but they are clean and permissible dates, and the substance is the same. The same happens with all other plants." (Ibn Hazm, 2000)

Ibn Akil emphasized that the use of impure materials may be undesirable, but not prohibited, and thus cannot be considered impure. He explains that impurity can essentially be transformed into something pure, just as blood in the body transforms into flesh or milk. Additionally, Sa'd ibn Abu Waqqas used human excrement as fertilizer for his land, stating: "The amount of excrement is equal to the amount of

grain,"where "excrement" refers to human excrement.<sup>1</sup>

Ibn Qayyim said: "According to this principle, the purity of wine becomes possible through transformation (al-Istihala), as it is impure by its nature; when the cause of this impurity is removed, it ceases to exist. This is the foundation of Shariah law, as well as the basis of reward and punishment. Based on this, proper analogical reasoning can be applied to all impurities that have changed. Thus, crops and fruits irrigated with impure water, and then with pure water, become permissible for use because the impurity has been removed and replaced with purity. In contrast, if a pure thing turns into an impure one, like water or food that transforms into urine or excrement, then it becomes impure."

"It is possible for a pure thing to turn into an impure one, but not for an impure thing to turn into a pure one. Allah, Exalted is He, creates purity from impurity and impurity from purity. The original nature of the thing is not important, but its essence is. Maintaining the status of impurity is not possible when both the name and the attribute are removed. The law is based on the name and the attribute of the thing, and it changes with them. The texts that prohibit carrion, blood, pork, and wine do not apply to crops, fruits, ashes, salt, soil, or vinegar – neither in meaning, essence, nor analogy."

Those who differentiate between the transformation of wine and other things claim that wine became impure through transformation, and thus it is also purified through the same process. However, it can be argued that blood, urine, and excrement also became impure through a change in state, and thus they can also be purified through transformation. In this way, it is shown that the analogy is in accordance with the texts, while opposing opinions contradict them." (Ibn Qayyim, 2020)

Elsewhere, Ibn Qayyim says: "The majority of scholars allow the use of impure fertilizers in

cultivating the soil for growing crops, fruits, and vegetables, even though they themselves are impure." (Ibn Qayyim, 2020)

### **Second Opinion:**

According to the Hanbali school of thought, the use of impure substances for fertilizing crops and irrigating plants is considered prohibited. This opinion is based on a narration from Ibn Abbas, who said: "We leased the land of the Prophet, peace be upon him, and conditioned that it not be fertilized with human waste." (El-Bejheki, 1994). Scholars of the Hanbali school believe that plants absorb impurity, and that the change in the state of impurity and its transformation cannot make it a pure substance. According to the Hanbali school, plants that are irrigated with impure water or fertilized with impure manure are considered prohibited, and the fruits produced from them are also impure.

Imam El-Buhuti says: "Crops that are irrigated with dirty water or fertilized with impure manure, whether the land or any other suitable material for crops is involved, are considered prohibited and impure. This stance is based on a hadith narrated by Ibn Abbas, may Allah be pleased with him, who said: 'We leased the land of the Prophet, peace be upon him, and conditioned that it not be fertilized with human waste.' If this were not prohibited, setting such a condition would be meaningless. Also, the parts of plants that grow from impurity do not become pure, as changing the state of impurity cannot result in purification." (Shurunbulali, 2002).

Imam El-Merdavi states: "Crops that are irrigated with dirty water are considered prohibited and impure, and this is generally accepted. This is clearly stated, and most scholars agree on this. However, Ibn Akil argued that such crops are neither impure nor prohibited, but are considered pure due to the change in state."<sup>2</sup>

Sheikh Ibn Uthaymeen said: "According to the well-known opinion of the Hanbali school, it is

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<sup>1</sup> El-Insaf, 10/368.

<sup>2</sup> El-Insaf, pg. 368.

prohibited to consume fruits and crops that have been fertilized with impure sources or soaked in impure water, unless they are washed with clean water and the impurity is removed. Most scholars believe that it is not prohibited or impure, unless the impurity manifests in the taste, smell, or appearance of the fruit, which is the correct opinion." (Ibn Uthaymeen, 1994).

### **Shariah Legal Opinion on Fertilizer Derived from Dried Blood**

Dried blood (Blood Meal) is a rich source of nitrogen and is used as an organic fertilizer to improve plant growth in home gardens, especially in soil that has been depleted by continuous planting. This fertilizer is produced from animal blood, particularly from cattle, and sometimes from pigs. After processing the blood and converting it into a dried powder, other substances are added to prepare the fertilizer for use. Dried blood contains a high level of amino acids, which are necessary for plant growth.

This fertilizer is specifically formulated by a company to accelerate tomato growth (CHASE ORGANIC TOMATO FEED). It contains approved organic components: seaweed, sugar, and amino acids derived from dried blood through a process known as hydrolysis. Therefore, this fertilizer is not just dried blood, but also contains amino acids extracted from dried blood via certain chemical processes known as "hydrolysis."

Based on the opinion of the majority of scholars, it is permissible to use dried blood or fertilizers containing amino acids obtained from dried blood, as it is considered that, although impure, fertilizing with such substances is not prohibited.

It is recommended to adhere to health and legal regulations to avoid potential harm to people. If these substances undergo chemical processes that

change their composition, they are considered to have transformed from impure to pure.

### **Shariah Legal Status of Animals That Feed on Impurities**

An animal that feeds on impurities is known as "jalalah" (coprophage) in Shariah legal terminology. Jalalah refers to an animal that consumes feces, with feces often referred to as "jille".<sup>3</sup>

Ebu Davud, may Allah have mercy on him, said: "Jalalah is an animal that feeds on feces." (Ebu Davud, 2012) Imam Ahmed, may Allah have mercy on him, also emphasized: "Jalalah is that which feeds on feces, whether it is livestock or birds." (Ebu Davud, 2012) These statements can be found in the work "Masail Imam Ahmed," narrated by Ebu Davud.

The term "jalalah" encompasses all animals that feed on impurities, regardless of their type, including camels, cows, sheep, chickens, geese, and other edible animals. Imam Nevevi, may Allah have mercy on him, stated: "Jalalah can be a camel, cow, sheep, chicken, goose, and other similar animals." (Imam Nevevi, 1999)

In a hadith narrated by Ibn Abbas, may Allah be pleased with him, it is mentioned: "The Prophet, peace be upon him, prohibited the milk of a jalalah." (Tirmidhi, 2010)<sup>4</sup> Additionally, it is narrated from Ibn Omar, may Allah be pleased with him, that he said: "The Prophet, peace be upon him, prohibited the consumption of the meat of a jalalah (an animal that feeds on impurities) and its milk." (Tirmidhi, 2010) From Abdullah ibn Amr, may Allah be pleased with him, it is narrated: "The Prophet, peace be upon him, prohibited on the day of Khaybar the meat of domestic donkeys, jalalah (an animal that feeds

<sup>3</sup> See: Garib el-Hadis, Kasim bin Selam, 1/78, and Garib el-Hadis, Ibn Kutajbe, 1/276.

<sup>4</sup> Tirmizi, Sunnen, br. 1825, Imam Nawawi graded it as authentic, and Ibn Hajar, in *Fath* (9/649), stated: "This hadith meets the conditions of al-Bukhari's collection."

on impurities), riding it, and consuming its meat." (An-Nasa'i, 1986).<sup>5</sup>

From these hadiths, it is clear that three things are prohibited: consuming the meat of a *jalalah* (coprophage), drinking its milk, and riding it. According to the opinion of the majority of scholars, the prohibition extends to eating the eggs of a *jalalah*.<sup>6</sup>

### Types of Animals that Feed on Impurities in Shariah Law

#### 1. If an animal consumes impurities in small quantities while the majority of its food is clean, the rule of *jalalah* does not apply to it.

Imam al-Hatabi, may Allah have mercy on him, said: "If an animal grazes in the pasture, eating grains, and occasionally consumes something impure, it is not considered a *jalalah* (coprophage). It is similar to chickens and other animals that occasionally eat something impure while the majority of their food comes from clean sources. Therefore, their meat is not prohibited." (Imam Hatabi, 2005)

Sheikh Ibn Uthaymeen, may Allah have mercy on him, also stated: "If an animal eats both clean and impure food, but the majority of its diet is clean, it is not a *jalalah*, and its meat is permissible. This rule can be seen in some bird breeders who feed them liquid blood to strengthen or accelerate their growth; this does not make their meat forbidden or undesirable because the majority of the food is clean." (Ibn Uthaymeen, 1994)<sup>7</sup>

#### 2. If the majority of the animal's food is impurity and this affects the meat and odor of the animal, the prohibition applies. In this case, it is forbidden to eat its meat, drink its milk, or ride it.

Al-Kasani, may Allah have mercy on him, said: "A *jalalah* (coprophage) is only an animal whose condition has changed and from which an odor is

sensed; it is then forbidden to drink its milk or eat its meat." (Al-Kasani, 1982)

Imam Ibrahim al-Harbi explained: "It is prohibited to drink its milk because anyone who consumes it will taste the contents of what it ate. Similarly, it is forbidden to eat its meat, and riding it is also prohibited because it sweats, and the odor of impurity can be detected in its sweat, which the rider will surely notice."<sup>8</sup>

#### 3. If the majority of the food an animal consumes is impure, but its effects are not noticeable in the animal's meat or smell, the question arises whether such an animal is considered *jalalah* or not.

According to the Hanafi and Shafi'i schools, such animals are not considered **jalalah** because a condition for **jalalah** is that the effect of consuming impurity is noticeable in the meat and smell. Al-Sarakhsi, *rahimahullah*, stated: "Jalalah is an animal that frequently feeds on carcasses, causing its meat to change and become foul-smelling, making it prohibited to eat. However, an animal that mixes carcasses with pure food in a way that the effect is not noticeable in the meat is not prohibited for consumption." (Al-Sarakhsi, 2008)

Imam Nawawi, *rahimahullah*, stated: "The quantity of impurity is not decisive; rather, what matters is whether an odor or foul smell is detected. If the smell of impurity is present in its sweat or elsewhere, then it is considered *jalalah*; otherwise, it is not." (Imam Nawawi, 1999)

Abu al-Ma'ali al-Juwayni, *rahimahullah*, said: "The ruling does not depend on the quantity of impurity, but rather on the presence of an odor, which can be examined at the time of slaughter."

This perspective further strengthens the argument that impurity that undergoes transformation (i.e., becomes something else) holds no legal significance unless its effect is noticeable. As

<sup>5</sup> Nesai, Sunnen, br. 4447., Ibn Hajar graded it as good (hasan) in his work "Fath" 9/648.

<sup>6</sup> See: El-Insaf 10/366, and Mevsua' Fikhije, 8/266.

<sup>7</sup> Sharh Riyad es-Salihin, 6/434.

<sup>8</sup> Garib el-Hadis, 1/115.

mentioned earlier, plants and crops nourished by impurities are not problematic, as they become pure after transforming into nutrients used by trees, unless the effect of impurity is visible in the grain or fruit. Both cases are similar.

Al-Bayhaqi, *rahimahullah*, said: "What has been transmitted regarding the prohibition of *jalalah*, and what scholars have stated, applies to the presence of the impurity's odor in the meat." (*Al-Bayhaqi, 2008*)

Shaykh Khalid al-Mushayqih stated: "The correct view on this issue is that if impurity affects the taste of the meat, its smell, or its milk, or causes diseases, it is prohibited; but if there is no effect, it is permissible. This is because impurities are purified through transformation, and these substances have become meat, blood, milk, etc. This is the strongest scholarly opinion, *rahimahullah*, regarding *jalalah*."

According to the Hanbali school, such an animal is considered *jalalah*, as they define *jalalah* as an animal whose majority of food consists of impurities, regardless of whether its effects are noticeable or not. Ibn Qudamah, *rahimahullah*, stated: "If the majority of its food is impure, its meat and milk are prohibited; but if the majority of its food is pure, then neither eating nor drinking from it is prohibited." (*Ibn Qudamah, 1968*)

**4. If the animal is a *jalalah*, its meat is not allowed to be eaten until the odor and signs of impurity are removed.** This is achieved by isolating the animal and feeding it clean food. Ibn Qudama, may Allah have mercy on him, stated: "The prohibition is lifted by isolating the animal, which is widely accepted." (*Ibn Qudama, 1968*)

Al-Nawawi explained: "If the animal is isolated after the signs of impurity appear and is fed clean food, and the odor disappears, then slaughtering the animal becomes permissible. There is no

specific amount of food or time limit; it is only important to ensure that the impurity's odor is sufficiently eliminated." (*Imam al-Nawawi, 1999*)

Sheikh al-Islam Ibn Taymiyyah, may Allah have mercy on him, emphasized: "If the animal is isolated until it becomes clean, it becomes permissible according to the consensus of Muslims. Before that, signs of impurity can be seen in its milk, eggs, and sweat, and the stench is noticeable. Once the impurity is removed, it becomes clean, and the ruling based on the cause is lifted when the cause is gone." (*Ibn Taymiyyah, 2005*)

#### **5. Is the consumption of *jalalah* meat prohibited or undesirable?**

According to Hanbali scholars, the meat, eggs, and milk of a *jalalah* are forbidden, and riding it is considered undesirable.<sup>9</sup> According to Hanafi, Shafi'i, and one opinion within the Hanbali School, consuming, drinking the milk, and riding a *jalalah* are considered undesirable.<sup>10</sup> Al-Hatabi, may Allah have mercy on him, stated: "Consuming the meat and milk of a *jalalah* is undesirable because it emits the stench of impurity." (*Al-Hatabi, 2015*)

Hafiz Ibn Hajar, may Allah have mercy on him, said: "The Shafi'i group, as well as the Hanbali view, considers the prohibition based on the fact that it is forbidden food; this also includes eggs, along with milk and meat." (*Ibn Hajar, 1999*)

Sheikh Ibn Uthaymeen, may Allah have mercy on him, added: "The prohibition of riding is due to purity, and the prohibition of consuming the meat or milk is either undesirable or strictly forbidden, depending on the different opinions among scholars." (*Ibn Uthaymeen, 1994*)

#### **Conclusion**

<sup>9</sup> El-Insaf,10/356, and Sharh Muntaha el-Iradat, 3/411.

<sup>10</sup> Bada'i es-Sanai, 5/40, and El-Mughni El-Muhtadż, 4/304.

The Shariah legal treatment of fruits and vegetables grown using organic animal-based fertilizers presents a complex and significant aspect of Islamic law. Understanding the different types of organic fertilizers, such as manure and dried blood, is key to determining their purity and compliance with Shariah principles. The use of these fertilizers can significantly improve soil quality and fertility, but it also poses challenges regarding hygiene and the proper treatment of animals.

It is essential to note that the Shariah treatment of animals, such as their meat, milk, and eggs, plays a crucial role in determining the legality and purity of food products. Rights to nutrition and producer responsibility toward consumers require strict adherence to Shariah norms regarding animal rearing, feeding, and usage.

Given all the above, it is clear that the proper application of Shariah principles can contribute to sustainable development and agricultural production improvements, while ensuring food that is not only tasty but also in line with Islamic values and standards. Further research into this topic is necessary to ensure practices align with modern needs and market demands while adhering to Shariah principles.

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## Šerijatsko pravni tretman voća i povrća za čiji uzgoj je korišteno organsko đubrivo životinjskog porijekla

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### SAŽETAK

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Tema šerijatskopravnog tretmana voća i povrća uzgojenog korištenjem organskih đubriva životinjskog porijekla obuhvata značajan aspekt u islamskom pravu, s obzirom na uticaj ovih praksi na prehrambenu sigurnost i higijenske standarde. Organska đubriva, uključujući kompost, stajnjak, i osušenu krv, igraju ključnu ulogu u poboljšanju plodnosti tla i kvaliteta proizvoda. Upotreba osušene krvi kao đubriva je predmet posebne rasprave među šerijatskim pravnicima, s obzirom na to da se često smatra nečistom, a njena primena zavisi od izvora i vrste životinja.

Šerijatski tretman životinja čije meso, mleko i jaja se koriste kao izvor hranljivih materija takođe zahteva pažljivo razmatranje. Prava na ishranu i higijenu hrane su usko povezana s vrstom životinja, njihovim hranjenjem, te načinima uzgoja. Kroz analizu ovih elemenata, istražujemo kako se šerijatski principi primenjuju na organske proizvode i kakav uticaj imaju na praksu i pravne norme u savremenom agraru.

**Ključne reči:** Šerijatsko parvo, organska đubriva, voće i povrće, osušena krv, fermentacija, dželala(koprofag), transfoimirat.

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## JOURNAL OF HALAL QUALITY AND CERTIFICATION

### Responsibility at work

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#### ABSTRACT

Responsibility in the workplace is a key characteristic that shapes individuals' behavior within a work environment. Responsibility is omnipresent in human life, representing the acceptance of consequences for one's actions. In a professional setting, it is a fundamental factor influencing efficiency, professionalism, and interpersonal relationships at the workplace. Employees should take responsibility for their tasks, decisions, and actions, thereby contributing to efficient work and creating a positive work atmosphere.

Taking responsibility involves not only fulfilling assigned duties but also the ability to recognize and correct mistakes, as well as contributing to the achievement of common goals. Responsible behavior contributes not only to personal growth but also to the improvement of the organization as a whole. Responsibility is linked to legal regulations and moral principles and is an important part of business relationships.

Business responsibility entails the proper execution of accepted work tasks, and its source lies within the individual. If a person agrees to perform a business task, they also assume responsibility for that task. For an assigned work task, the individual is accountable to a superior.

In Islam, responsibility in the workplace is considered a key aspect of personal ethics, respect, and spiritual integrity. Islam sets high standards regarding responsibility, whether in fulfilling obligations towards employers, colleagues, or the community. It emphasizes that taking responsibility in all aspects of life is not only a social or professional duty but also a spiritual obligation before Allah (SWT). By following the core principles of Islam, employees and employers are called upon to act responsibly, adhering to ethical norms that contribute to building a fair, just, and prosperous society.

Responsibility in all business segments should be the goal of modern organizations, as those who engage in irresponsible business practices are destined for market loss and poor business results. This paper will explore the issue of responsibility from multiple perspectives and analyze various aspects of responsibility, including professionalism, accuracy, precision, teamwork, collegiality, and accountability, as well as how these traits impact the overall productivity of an organization.

**Keywords:** responsibility, Islamic aspect, ethics, business, management, social responsibility

## Introduction

In today's business world, responsibility is becoming increasingly important for both individuals and organizations. Responsibility in a business context is not just a formal requirement but entails the obligation of every employee to perform their job properly, make the right decisions, recognize mistakes and learn from them, and contribute to the overall success of the organization. Responsibility is a multifaceted concept that encompasses all areas of human activity. It is closely linked to two key aspects—legal regulations and ethics.

Legal regulations define the responsibilities of all participants in business processes and the consequences of failing to meet these responsibilities. Ethics, on the other hand, consists of personal, immeasurable values that determine how an individual approaches work and other obligations, and whether their behavior can be considered responsible. The role of responsibility in business ethics is invaluable, as it directly affects productivity, professionalism, and interpersonal relationships in the workplace.

Professionalism, accuracy, precision, collegiality, and accountability are key factors in achieving high standards in everyday business operations. Taking responsibility contributes not only to professional but also to personal development. Additionally, responsibility is often seen as a fundamental element of leadership, as leaders must set an example of responsible behavior to motivate and inspire their teams.

Business responsibility refers to the proper execution of accepted business tasks. Business-responsible individuals are those who perform their assigned tasks in accordance with the expectations outlined by the organization's business strategy. Socially responsible business practices have become an imperative for all organizations that value their reputation. Responsible communication is also essential for delivering appropriate business messages, which in itself requires accountability.

This paper will explore various aspects of responsibility, its benefits, and the challenges associated with its development. It will also examine the significance of responsibility in the context of professional behavior, collegiality, teamwork, and other key traits that support an efficient business process. The main hypothesis of this paper is that responsibility must be present in various segments of business and that without responsible individuals, successful business operations cannot exist.

To ensure business success, it is necessary to pay attention to the proper implementation of all business segments. Islam teaches that responsibility in business, as in all aspects of life, is the foundation of a just and successful life. Through the Qur'an and Hadith, Islam provides clear guidelines on how Muslims, as well as all people, should approach their obligations—whether business, family, or social responsibilities. Responsibility towards Allah (SWT), fulfilling obligations towards others, honesty, integrity, and accountability for mistakes are key traits that shape proper behavior in both business and society.

## The Concept of Responsibility and Terminological Definition

The concept of responsibility, as well as the practice of responsibility itself, is learned from an early age. Parents teach their children responsibility and encourage them to behave responsibly. It is expected that all individuals understand what responsibility means, but the perception of this concept largely depends on the individual. This is why it is important to define the term responsibility from a terminological perspective.

In general, responsibility refers to a state in which someone is held accountable for a certain failure or omission towards another person. In this sense,

there is a distinction between civil-law and civic responsibility.<sup>1</sup>

### **The History of the Concept of Responsibility and Its Connection to Ethics**

Throughout history, the concept of responsibility has been most commonly used in a legal sense, encompassing both legal and moral responsibility. Often, legal and moral responsibility were considered equivalent, as they were frequently aligned throughout history. One of the oldest surviving legal codes in the world is the Code of Hammurabi, compiled between 1755 and 1750 BCE. It is regarded as the primary source of Babylonian law and serves as the foundation for many modern legal systems. In addition to containing a set of laws, it also prescribes punishments for failing to adhere to them (Benić, 2017). Ancient Greece left an indelible mark on all areas of human activity, including art, politics, medicine, physics, philosophy, economics, and education. Although economics did not exist as a formal science in ancient Greece, it was still studied within the framework of ethics. At that time, the concept of responsibility was primarily viewed in connection with ethics. Aristotle, one of the three most influential ancient Greek philosophers, alongside Plato and Socrates, believed that only a person who acted freely could be held accountable for their actions (Vučković, 2000). A person who did not act freely due to reasons such as mental illness or coercion could not be held responsible for their actions. Aristotle is credited with developing the first theory of moral responsibility. He also viewed ethics, economics, and ethical business practices as interconnected aspects of the same concept. Based on this understanding, business ethics was defined as conducting business in a way that ensures mutual benefit—both for the individual or organization performing the work and for others (Bebek, Kolumbić, 2000). The foundations that shape and define responsibility include faith, laws and

regulations, ethics or morality, customs, and traditions. Governance and societal leadership are roles that align with the principle of public and common interest, requiring skills and competencies that effectively respond to these needs.

### **Ethical and Spiritual Responsibility: Towards Allah, Oneself, People, and Work**

In Islam, every Muslim is aware that they have been placed on this earth as God's vicegerent (khalifa) and that they will be held accountable before Allah (SWT) for all their actions, including their work. Work is considered an act of worship (ibadah), and fulfilling professional obligations encompasses all duties that hold moral value. Even the simplest job, when performed with good intentions, becomes a means of drawing closer to Allah (SWT).

Islam teaches that work should be carried out with dedication, sincerity, and responsibility, as any work performed in accordance with Allah's laws becomes an act worthy of reward. Islam assigns responsibilities to individuals based on their circumstances and competencies while warning against negligence and failure to fulfil entrusted duties. Prophet Muhammad (PBUH) clarified that every person will be held accountable before Allah (SWT), saying: *"All of you are shepherds, and each of you is responsible for his flock. A leader is a shepherd and is responsible for his people. A man is a shepherd over his family and is responsible for them. A woman is a shepherd in her husband's house and is responsible for her household. A servant is a shepherd over his master's wealth and is responsible for it. All of you are shepherds, and all of you will be questioned about your flock."* (Bukhari, 2008)

Islam teaches that all our actions, including work, are a responsibility before Allah (SWT). Every activity we engage in must be directed toward

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<sup>1</sup><http://www.enciklopedija.hr/natuknica.aspx?id=447>  
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seeking God's pleasure and must be carried out with sincerity and respect. The Qur'an clearly states that people do not work solely for themselves but will be held accountable before Allah (SWT) for their deeds.

Allah (SWT) says in the Qur'an: *"And say, 'Do [righteous deeds], for Allah will see your deeds, and [so will] His Messenger and the believers. And you will be returned to the Knower of the unseen and the witnessed, and He will inform you of what you used to do.'"* (Qur'an, At-Tawbah 9:105)

This verse reminds us that everything we do, including our work, must be done responsibly, as we will be held accountable before Allah (SWT) for our actions. Prophet Muhammad (PBUH) further emphasized this by stating: *"Whoever cheats is not one of us."* (Muslim, 2004)

Deception in business is considered a serious sin because it undermines trust and justice, which are fundamental principles of Islamic ethics.

The purpose of human existence is, among other things, to fulfill religious obligations to attain God's pleasure through acts of worship (ibadah). Allah (SWT) states that humans and jinn were created solely to worship Him. Prophet Muhammad (PBUH) explained the concept of worship and servitude to Allah when asked about ihsan (excellence in faith) by Angel Jibril, saying: *"To worship Allah as if you see Him, for even if you do not see Him, He sees you."*

Every action, even the smallest deed—such as removing an obstacle from a path—is considered an act of worship in Islam. The success of one's life depends on the extent to which they are willing to follow divine guidance. Allah (SWT) says: *"O you who have believed, upon you is [responsibility for] yourselves. Those who have gone astray will not harm you when you have been guided. To Allah is your return all together; then He will inform you of what you used to do."* (Qur'an, Al-Ma'idah 5:105)

Imam Ahmad recorded that Abu Bakr (RA) once stood and addressed the believers, saying: *"O people, you recite this verse, but you misunderstand it. I heard the Messenger of Allah (PBUH) say: 'If people witness wrongdoing and do not take action to stop it, it is inevitable that Allah will send a punishment upon them for their indifference.'"*

The Prophet (PBUH) also advised that no one will attain complete faith until they wish for others what they wish for themselves. Responsibility toward others is a broad concept in Islam. The Qur'an and Hadith leave no detail unaddressed in this regard. No religion, law, system, or way of life emphasizes interpersonal relations as much as Islam does.

### **Freedom and Responsibility**

From freedom arises individual and concrete responsibility for our actions. There is no person without responsibility. It is usually not just one, but rather multiple, a series of specific responsibilities. In addition to personal and parental responsibility for oneself and one's family, we inevitably bear civic, professional, and political responsibility as well. Our civic responsibility concerns our relationship with public and common good. Ignoring or staying on the sidelines when it comes to public and common good, especially in the case of Muslims, is a grave neglect of an important Quranic obligation—enjoining good and forbidding evil. *"The believers, men and women, are allies of one another. They enjoin what is right and forbid what is wrong, establish prayer, give zakat, and obey Allah and His Messenger. It is they upon whom Allah will have mercy. Indeed, Allah is Almighty and Wise."* (Qur'an, At-Tawbah, 9:71) Civic and professional responsibility should not be equated or confused. Freedom and responsibility are two essential prerequisites for the moral renewal of both society and the individual. Without a free act, there is no true good deed, and without responsible conduct, there is no orderly and functional society.

## When Trust Disappears

The Messenger of Allah, peace be upon him, valued leadership as a form of trust (amanah). He frequently warned his companions, and through them the entire ummah, about the importance of this trust. The rise to power and leadership positions of those who lack the necessary qualifications and moral integrity is considered a sign of the Day of Judgment. A well-known hadith on this topic is recorded in hadith collections.

On one occasion, the Prophet, peace be upon him, was sitting and speaking with his companions when a Bedouin approached and asked, *“When will the Day of Judgment occur?”* The Prophet, peace be upon him, continued his discussion, and after he had finished, he asked, *“Where is the one who asked about the Day of Judgment?”* The man responded, *“I am here, O Messenger of Allah.”* The Prophet, peace be upon him, then said, *“When trust (amanah) is lost and when there is no more honesty.”* The man asked again, *“How will trust be lost?”* The Prophet, peace be upon him, replied, *“When leadership and governance are entrusted to those who are not worthy of it, then expect the Day of Judgment.”* (Bukhari, 2008)

The abuse of public office, acting in self-interest, and oppressing the servants of Allah, the Almighty, constitute a betrayal of the entrusted amanah. Such actions lead to problems in this world and distance a person from the nearness of Allah on the Day of Judgment.

Aisha, may Allah be pleased with her, narrated that the Prophet, peace be upon him, said: *“Indeed, Allah, the Almighty, loves that when one of you undertakes a task, he performs it in the best possible manner.”* (Bayhaqi and others, 2003) A similar hadith states: *“Indeed, Allah, the Almighty, loves a worker who performs his work with excellence and integrity.”* (Bayhaqi, 2003) This is an important hadith for everyone who works, has a profession, and desires to be among those whom our Creator loves.

In another hadith, the Prophet, peace be upon him, teaches that every person is predisposed to perform with ease the task that has been destined for him, meaning the work for which he has the skills and aptitude, and the willingness to carry out. This is especially expected from believers because their correct and responsible approach to work is also a representation of their faith. It is highly inappropriate and unethical when people fail to fulfill their work obligations properly, or even fail to uphold the promises they made when agreeing to a job. By doing so, they harm not only themselves but, more importantly, they harm their religion, which does not teach such attitudes toward work and people.

The context of this hadith is an event witnessed by a young boy named Kulayb, may Allah be pleased with him. He said: *“I was a young boy old enough to understand and remember what was happening. We were with the Prophet, peace be upon him, at a cemetery when a funeral was brought in. Since the grave was not properly dug and prepared, the Prophet, peace be upon him, called out, ‘Level and properly prepare this grave!’ When the Prophet, peace be upon him, feared that people might consider this to be a religious obligation (sunnah), he turned to them and said, ‘This (preparation of the grave) will neither benefit nor harm the deceased, but indeed, Allah, the Almighty, loves that when one of you undertakes a task, he performs it in the best possible manner.’”* (Al-Isabah, Ibn Hajar, 3/305)

If leveling a grave and ensuring its proper preparation was the reason for such a strong and important statement from the Prophet, peace be upon him, then how much more significant is this for major responsibilities and entrusted duties? The importance of performing work with excellence, fairness, and expertise is further emphasized in another hadith: *“Indeed, Allah, the Almighty, has decreed excellence in every matter. So, when you kill, do so in the best manner, and when you slaughter, do so in the best manner. Let each of you sharpen his knife so that he may ease the suffering of the animal he slaughters.”* (Muslim, 2004) From this, it is understood that

beauty and integrity in performing work are religious obligations.

### **Justice and Responsibility**

In Islam, the importance of fairness towards colleagues and employees is emphasized. Employers have the responsibility to be just and fair towards their employees, while employees must fulfill their duties responsibly. Islam calls for fair treatment of everyone, regardless of their race, gender, or social status, as justice is the foundation of business ethics in Islam.

*“He to whom his evil deeds are made to appear good, and he considers them good...”* (Quran, Fatir, 8).

This verse reminds us to always be cautious, ensuring that we do not mistakenly do something bad while thinking we are doing something noble. Allah, the Almighty, says: *“Say: ‘Shall we inform you of those whose deeds will be worthless in this life and who think that they are doing good deeds?’”* (Al-Kahf, 103-104)

Prophet Muhammad, peace be upon him, assigned responsibilities to people based on their status and capabilities, and he warned about irresponsibility and neglect of entrusted duties. *“All of you are shepherds, and each of you is responsible for his flock.”* (Bukhari, 2008) Moreover, the Prophet, peace be upon him, explained that everyone is accountable for their actions, saying: *“If we assign someone a job and a wage, and they take more than they are entitled to, such a person is a thief.”* (Abu Dawud, 2012)

### **Why is it important to be responsible at work? The significance of responsibility in an organization**

Accepting responsibility is a confirmation of virtues and capabilities. Mistakes are inevitable, but what matters is how we accept those mistakes. Much can be learned from mistakes, and this mindset demonstrates courage and

accountability. Knowing how to take responsibility at work can help us be more productive and achieve career progress.

Responsibility can be classified in various ways, with the most common distinction being between personal and professional responsibility.

Personal responsibility refers to an individual's ability to take responsibility for their actions, decisions, and behavior, both in their private and professional lives. This includes the ability to recognize mistakes and learn from them, as well as acting responsibly in all aspects of life.

Professional responsibility pertains to the duties an employee has towards their job, colleagues, clients, and employer. This type of responsibility involves meeting deadlines, performing tasks to a high standard, respecting professional norms and ethical standards, and directing all activities towards achieving the organization's interests. Professional responsibility also includes the ability to make ethical decisions that do not harm the reputation or image of the organization.

Organizations that foster responsibility among employees are often characterized by high productivity and work quality. Responsibility in an organization plays a key role in maintaining productivity, reducing mistakes, and improving interpersonal relationships. Responsible employees can rely on their colleagues, as everyone recognizes the importance of collective effort to achieve goals. Employees who acknowledge their obligations and responsibilities become the backbone of the organization, as their behavior directly impacts the work atmosphere and final results. Responsible employees not only complete their tasks but also actively contribute to the development of the team, making the work environment stable and motivating. Furthermore, responsibility contributes to reducing mistakes, misunderstandings, and uncertainty, as every employee knows what is expected of them. Organizations that cultivate responsibility among their employees lay the foundation for more

efficient decision-making, faster problem-solving, and a higher level of trust within the team.

### **Developing responsibility among employees**

In order to develop responsibility among employees, it is important to create a work environment that encourages positive behavior, as well as establish a work culture that emphasizes the importance of responsible conduct and encourages proactivity. This includes clearly defining tasks, setting goals, providing appropriate training, and encouraging employees to take initiative. Employers must lead by example when it comes to responsible behavior and offer support to employees in developing their skills and abilities, thereby motivating them.

Additionally, positive feedback and recognition for a job well done play a key role in motivating employees. Transparency in communication, providing constructive feedback, and rewarding responsible behavior can further encourage employees to take ownership of their work. It is also essential to create an environment where mistakes are not perceived as negativity but as opportunities for learning and improvement.

### **Responsibility in Business**

When considering business responsibility, it is necessary to examine business ethics. Business ethics, by definition, is "the application of ethical principles in business relationships and activities (with many organizations having formal written ethical codes...)" (Bebek, Kolumbić, 2000). The goal of business ethics is to successfully complete the tasks being executed for others. Therefore, a person who acts ethically in a business sense must be doubly ethical: ethical towards others and ethical towards themselves. It can also be defined as "a set of moral rules and values that influence and guide the behaviour of individuals or groups regarding what is considered good or bad" (Aleksić, 2007). From this, it follows that the goal of business ethics is to encourage individuals or

business communities to change their behavior and direct it towards what is considered good.

The ethical behaviour of an organization is influenced by various factors. All factors of ethical behaviour should be adopted as a corporate behaviour principle, but each individual should also adopt them as a kind of personal ethical business norm. Since organizations operate in cooperation with many external business partners, their ethical systems also lead to the ethical behaviour of the organization. Business ethics is closely related to business responsibility. For example, employees agree to take on business responsibility by signing an employment contract. Another important document used to define the structure of business responsibility within any business organization is the ethical code. The ethical code "represents the rules of desirable behaviour based on fundamental values, principles, and rules of responsible business and organizational behaviour" (Aleksić, 2007). However, it is important to note that an ethical code does not dictate to individuals how they must behave.

An individual's business responsibility is the obligation to complete assigned tasks. Business-responsible individuals perform the tasks entrusted to them as best as they can. The source of business responsibility lies in the individual, and when a person agrees to carry out a business task, they have also assumed responsibility for that task. For the assigned task, the individual is responsible to the superior (Certo, 2008). Business responsibility is defined as "the obligation to complete the task with a satisfactory solution" (Buble, 2010). In doing so, each employee must clearly understand the boundaries of their responsibility, meaning they must know who is responsible for what. Furthermore, "business responsibility refers to a management philosophy in which individuals are considered legally or commercially responsible for the quality of their use of authority and fulfilling the responsibility of carrying out predetermined activities" (Certo, 2008). In other words, business responsibility implies that a person who agrees to

carry out a specific business task bears the responsibility to perform it adequately. Individuals who fail to complete their tasks will face certain penalties, while those who perform their tasks responsibly will be rewarded. If there were no form of penalty or sanction for failing to adhere to business responsibility, the survival of organizations would not be possible or would be very difficult to maintain long-term. For this reason, there are different types of contracts that regulate the relationship between employees and organizations, as well as sanctions for not fulfilling work obligations.

### **Responsibility in Decision Making**

Decision-making is a concept that encompasses activities related to all aspects of human life—ranging from simple decisions like choosing breakfast to more complex ones such as moving or purchasing a house. Decisions in private life usually concern fewer people, while business decisions are far more complex, impacting a larger group of people. Generally, decision-making involves selecting an action among various options (Sikavica, Hunjak et al., 2014). Business decision-making, therefore, involves choosing between multiple possibilities in a business context. However, in business, greater caution is needed because such decisions affect many more individuals.

Most decisions in an organization are made by management, although decision-making exists in other parts of the organization as well. Based on whether managers are inclined or averse to decision-making, they are categorized into:

- a) Managers who avoid problems
- b) Managers who solve problems
- c) Managers who search for problems

Managers who avoid problems ignore all information related to the problem and are unwilling to address it. Managers who solve problems deal with the issue as it arises. The most desirable managers are those who actively seek out problems before they occur and attempt to solve them (Ružić, 2019).

Thus, the most responsible managers are those who proactively search for problems. Responsible decision-making stems from both personal and organizational values. Personal values are stable beliefs held by an individual about whether certain behaviors are desirable or not. Organizational values are shared values within the organization, imposed on employees. The modern era has prompted many organizations to establish their own ethical codes or standards that outline the values they uphold.

In business, ethical dilemmas often arise, which are a regular part of operations. When making business decisions, questions related to ethics or morals frequently come up. Many business decisions are comparable to ethical decisions, so moral or ethical standards are crucial when making them. Since the ethicality of a decision cannot be observed outside of the context in which it was made, the same decision may seem ethical or unethical depending on the situation. Ethical decisions are those that are both legal and acceptable to the broader community, while unethical decisions are either illegal or unacceptable to a larger group of people. The primary criterion distinguishing ethical from unethical decisions is the moral question: "Will my decision harm or benefit someone?"

Therefore, ethics and morality are considered some of the most important elements in the decision-making process. A person cannot behave ethically in business and unethically in their private life—moral aspects of decision-making are interconnected across all areas of a person's life. There are five different sources of morality: social ethics, professional ethics, business ethics, organizational ethics, and personal ethics. Due to the complex influence of ethics on responsibility in decision-making, various models of ethical decision-making and individual behavior have been formed to better understand the process of responsible and ethical reasoning. One well-known model that outlines

decision-making as a four-step process is J. Rest's model<sup>2</sup>.

Furthermore, when determining whether a decision will be responsible, emotions play a significant role. Business decisions are often influenced by emotions, making them an important element in the decision-making process. Emotions can positively or negatively impact responsibility in decision-making, with self-control being key. Individuals with high emotional intelligence will make more rational business decisions, and emotions will actually assist in decision-making. Mistakes in decision-making arise from inadequate decision-making processes or from the way decision-makers think. They most often occur in uncertain or risky situations.<sup>3</sup> These mistakes are diverse and numerous, making them difficult to eliminate, but if a manager follows an appropriate decision-making pattern, mistakes will occur less frequently.

Thus, a responsible manager is one who anticipates problems before they arise and threaten business operations. Their decisions are often influenced by emotions, but guided by emotional intelligence, they thoughtfully consider their choices and avoid mistakes. It's important to note that emotional intelligence is the ability to recognize one's own feelings and the feelings of others, as well as to control emotions and motivate oneself (Sikavica, Hunjak et al., 2014).

### **Responsible Business Communication**

Communication is a fundamental characteristic of an organization, particularly as organizations are viewed as social systems. The amount of communication within an organization depends on its size; the larger the organization, the more communication there is, and the communication

relationships become more complex (Buble, 2006). Communication is an ongoing process that occurs daily, in all situations and circumstances. It is typically explained as the process through which a specific message is transferred from a sender to a receiver through a chosen medium. Effective communication means the receiver has understood the message exactly as the sender intended. Communication involves various participants: interlocutors, the message, interpretation and understanding of the message, the medium of communication, the manner in which the message is conveyed, feedback, and potential barriers during the sending and understanding of the message (Lamza-Maronić, Glavaš, 2008).

There are two main types of communication: verbal and non-verbal communication. Communication plays a very important role in the operations of any business organization because it involves building relationships at various levels. Business communication can occur on two different levels: within the organization and outside the organization.

Internal communication within the organization involves only employees of the organization, whereas external communication refers to all forms of business communication with partners, external collaborators, etc. In a business context, both verbal and non-verbal communication are important. Similarly, besides how communication takes place, what is communicated is also crucial. The content of all communication consists of data. The data being communicated should be truthful, timely, sufficient, in formal form, simple, specific, and clear to avoid any ambiguity that could lead to misinterpretation (Buble, 2006).

Responsibility is particularly important in all forms of formal communication, and business

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<sup>2</sup> The first step is moral awareness, meaning the decision-maker must recognize the moral issue at hand. The second step is moral judgment, where one must reflect on the possible choices and the consequences they may lead to. The third step is moral

intention; the moral issue must take priority over all other concerns. The fourth step is moral action, which involves taking concrete actions aligned with moral principles.

<sup>3</sup> Ibid.

communication is a form of formal communication. It is crucial for business organizations to consider the impression they leave on participants in business processes and the wider public because this type of communication shapes the organization's social status. Therefore, the organization's reputation and social status depend on the effectiveness of business communication (Tafra-Vlahović, 2015).

Formal business communication refers to official communication, meaning there are defined methods for communicating certain matters that all participants in the communication process must follow. There are two types of communication channels: vertical and horizontal. Vertical communication involves communication between superiors and subordinates. Vertical communication happens in two ways: downward and upward. In downward communication, superiors convey various messages to subordinates, while in upward communication, subordinates pass on messages and information to superiors (Buble, 2010).

Business communication is responsible for creating an identity, image, reputation, and brand. Reputation plays a key role in creating the value of the organization. "Reputation is understood as the esteem or regard of a person or organization" (Milas, 2011). Reputation is a collection of value judgments made over time about individuals, brands, or organizations, and it is part of the image. Reputation is formed based on direct experiences, making communication crucial for creating a positive reputation (Milas, 2011). Public relations (PR) is also an important component of business communication. Public relations should be organized according to ethical codes because they are a vital factor in a company's success. Ethical PR practices ensure the effective management of an organization's public image and contribute significantly to its overall success.

## **Professionalism and Responsibility in the Business Environment**

Professionalism and responsibility are two interconnected traits that shape the work behavior and perception of every employee.

Professionalism is manifested through the ability of an employee to perform tasks in accordance with high standards, meeting deadlines, and adhering to the ethical guidelines of the organization. Professionalism is a fundamental prerequisite for achieving high-quality work. A professional approach to work involves a high level of commitment, accuracy in completing tasks, respecting deadlines, and the ability to solve problems while upholding high ethical standards.

Responsibility, on the other hand, involves the ability to take ownership of one's duties and the obligation to make decisions and take actions carefully, considering the broader consequences. Responsibility is a key characteristic that ensures tasks are performed in the best possible way. It includes recognizing one's role within the organization, actively taking responsibility for tasks and outcomes, and accepting responsibility for collective goals.

Professionalism and responsibility often go hand in hand, as employees who understand the importance of performing their duties responsibly also contribute to the collective professionalism of the team and organization. Employees who recognize their responsibility often become drivers of positive change within the organization, motivating others to follow the same values. This approach creates a culture of responsibility that contributes to the overall professionalism of the team and organization, improving efficiency and helping to achieve shared goals, making the organization more successful and stable.

### **Teamwork, Collegiality, and Taking Responsibility**

Teamwork is the foundation of every successful business, as it is only through coordination with colleagues that common goals can be achieved. Collegiality, as a trait that involves respect, mutual help, and communication among team members, is essential for effective teamwork. Responsibility within the team means that each member recognizes their role and contributes to the achievement of the common goal. Taking responsibility for one's tasks and actively communicating with colleagues enables quick problem-solving and reduces the likelihood of misunderstandings or errors. Additionally, in a team, it is important to accept responsibility not only for successes but also for mistakes that occur during work. Accepting mistakes and learning from them allows for further professional and personal development, while also strengthening trust among team members. Teamwork is not only based on achieving common goals but also on mutual recognition of mistakes and imperfections, creating space for growth and improvement.

Islam encourages Muslims to be responsible for their mistakes. In the case of a mistake at work, a Muslim is called to recognize and admit their actions, learn from them, and strive to correct the damage. This is connected with leadership responsibility, where leaders, managers, or administrators should recognize their influence on the work environment and do everything possible to improve the situation if a problem arises. The Prophet Muhammad (PBUH) teaches us that anyone who repents for their mistake is like someone who has not sinned.

This hadith encourages every Muslim to take responsibility for their mistakes and to strive to make better choices in the future. Islam emphasizes the importance of teamwork and cooperation in the business environment. Collegiality, mutual help and support, and care for common goals are important aspects of proper behavior in Islam. The Prophet Muhammad

(PBUH) said: "A believer is to another believer like a wall, which supports each other." (Bukhari, 2004). This hadith calls for unity and support in the team, as success in business depends on coordinated and responsibly performed tasks by all team members. Islam also places great importance on teamwork and mutual support among people. Collegiality, respect, help, and cooperation are essential for achieving a common goal, whether in a business or social context. Islamic principles of cooperation and collegiality help create a stable and productive work environment. The Quran says: "And cooperate in righteousness and piety, but do not cooperate in sin and aggression." (Quran, Al-Ma'idah, 2). This verse calls for mutual assistance and cooperation in good, which also includes business activities. Muslims are obliged to help each other in performing their tasks and acting in the interest of the community.

### **Accuracy and Precision as Part of Responsibility**

Accuracy and precision are fundamental characteristics expected from every employee in the business environment, as they directly impact the quality of work and the efficiency of the organization. Accuracy involves meeting deadlines and responsibly approaching tasks, while precision entails careful execution of tasks, avoiding mistakes, and providing accurate information. Employees who demonstrate a high level of accuracy and precision not only contribute to the efficiency of work but also guide other team members toward achieving high standards. Responsible behavior, in this context, means that employees put effort into performing their tasks with care, thereby reducing the risk of errors that could negatively affect the organization.

### **Acceptance of Mistakes and Improvement of Responsibility**

Accepting mistakes is often a challenge, but it is essential for professional development and a culture of responsibility within an organization.

Mistakes are inevitable in any business, but what is crucial is how employees recognize and address them. Responsible behavior means that mistakes are not hidden but are openly acknowledged and used as opportunities for learning and improvement. Through the process of accepting mistakes, employees can enhance their skills and efficiency in future work. Organizations that encourage a culture where mistakes are seen as opportunities for growth and improvement create an environment where responsibility is fully integrated into daily work activities.

Responsibility for mistakes is an important trait that Islam emphasizes. Prophet Muhammad (PBUH) encouraged his followers to recognize their mistakes, admit them, and learn from them. Islam teaches us not to shy away from responsibility but to embrace it, as it is the path to personal and spiritual growth. "And those who, when they commit an immorality or wrong themselves, remember Allah and seek forgiveness for their sins—and who can forgive sins except Allah?" (Quran, Ali-Imran, 135). This verse indicates that acknowledging mistakes and seeking forgiveness from Allah (SWT) is an act of responsibility that leads to purification and personal development.

Prophet Muhammad (PBUH) also said, "Whoever makes a mistake and then repents, Allah will forgive him." (Bukhari, 2008). This hadith encourages Muslims to acknowledge their mistakes, take responsibility for them, and make an effort to correct them.

### **Respecting Obligations and Punctuality**

In Islam, accuracy and fulfilling commitments are highly valued. Islam is very strict when it comes to fulfilling obligations.

Prophet Muhammad (PBUH) said, "When a believer gives his word, he is obligated to fulfill it." (Bukhari, 2008). Furthermore, Prophet Muhammad (PBUH) also said, "Whoever deceives us is not one of us." (Muslim, 2004).

These hadiths clearly emphasize the importance of keeping promises and being responsible towards others, including business obligations. Through this principle, Islam calls for responsibility in every aspect of life, including duties towards employers, colleagues, and clients. Respecting deadlines and carrying out tasks accurately are considered great virtues.

"Indeed, Allah commands you to give trusts to whom they are due and when you judge between people, to judge with justice. Excellent is that which Allah instructs you. Indeed, Allah is ever Hearing and Seeing." (Quran, An-Nisa, 58). This verse calls on Muslims to carry out their duties with great care and responsibility, emphasizing that every task should be performed with complete dedication and precision.

### **Honesty, Fairness, and Correct Conduct in Business**

Islam strongly emphasizes honesty in all business transactions. Prophet Muhammad (PBUH) was known for his impartiality and fairness, and Muslims are called to follow him in all aspects of life, including business relationships. Prophet Muhammad (PBUH) said, "...and honesty is the foundation of every business." (Bukhari, 2004). In another hadith, Muhammad (PBUH) said, "When merchants agree and speak the truth, their trade is blessed, and when they deceive and hide the truth, their trade is cursed." (Bukhari, 2004).

This means that Muslims should conduct their business with high ethical standards, avoiding deceit, dishonest transactions, and fraud. Responsibility, therefore, extends beyond simply fulfilling tasks; it also involves upholding moral values in all business relations.

"Do not consume one another's wealth unjustly or send it [in bribery] to the rulers in order that [they might aid] you [to] consume a portion of the wealth of the people in sin, while you know [it is unlawful]." (Quran, Al-Baqarah, 188).

This verse clearly condemns dishonest business and fraud, reminding Muslims to adhere to justice and honesty in all their dealings and transactions.

### **How to Improve Responsibility**

**Identify Your Responsibilities** – One of the first steps in taking responsibility at work is ensuring that you are fully aware of your role and duties. Consider having a conversation with your managers to clarify your role within your team. You can also discuss with colleagues to better understand the scope of your responsibilities. Managers appreciate team members who understand their job obligations and focus on performing their tasks and activities to the best of their ability.

**Demonstrate Integrity at Work** – Integrity is a soft skill that requires time to develop. Individuals with integrity adhere to a strong moral code, and employers trust them to make ethical choices that will benefit the company and those around them. You can demonstrate integrity by acknowledging the work of others, being punctual, and maintaining confidentiality. This is an important trait for effective leadership and can help you build a better reputation in the workplace, which can open up opportunities for career advancement.

**Be Responsible for Your Work** – Responsibility includes acknowledging mistakes and any subsequent consequences. There is a distinction between responsibility and taking ownership in the workplace. Being responsible at work involves taking action, while taking ownership is the result of those actions. Learning to accept praise or recognition for good work and taking criticism when your efforts create problems are both forms of responsibility. Taking responsibility for your actions and self-assessing the outcomes can show maturity and a willingness to improve.

**Show Flexibility** – Flexibility is an important skill that can help you in both your professional and personal life. Flexibility may include

adjusting your work hours or transitioning into another role or department.

**Practice Active Listening** – Communication is an essential aspect of responsibility. Ensuring that you actively listen to your managers and colleagues can help build trust and demonstrate your reliability.

**Volunteer** – Helping others can also provide personal satisfaction that can reduce stress, teach you new skills, keep you mentally stimulated, and provide a sense of purpose.

**Assist Your Colleagues** – One of the easiest ways to take on more tasks at work is to assist colleagues who may have more work than you at a given time. See if there are additional tasks on their to-do list that you can help complete. In addition to helping yourself gain more responsibility, your colleagues will appreciate your assistance if they have a strong work ethic and if you're not working in a toxic environment.

**Be Proactive** – Being proactive at work means taking the initiative to complete tasks without supervision. Employers often value proactivity in the workplace, as it can contribute to increased productivity.

### **Summary**

Responsibility at work is not just a personal trait but a crucial factor for achieving success and creating a productive work environment. Employees who recognize and accept responsibility not only contribute to efficiency and productivity but also help build a positive work culture and interpersonal relationships. Organizations that encourage responsible behavior among employees will lay the foundation for long-term success and development. Therefore, responsibility should be a focus for both managers and all employees, as it is a key element of any professional environment.

Responsibility in work, according to the teachings of Islam, is not only a matter of professional ethics but is deeply rooted in the spiritual life of Muslims. Islam calls us to be responsible in all aspects of life, including work, to honor our commitments, be honest and accurate, and recognize and correct our mistakes. By fulfilling these responsibilities, Muslims not only contribute to the success of their organizations but also earn God's reward and blessing. Islam sets responsibility as the foundation of every successful business and social life, creating space for justice, cooperation, and personal growth.

Islam sets high standards for responsibility in the workplace. Responsibility to Allah, respect for obligations, honesty, taking responsibility for mistakes, collegiality, and fairness are key components that shape business ethics according to Islamic principles. Taking responsibility in daily tasks is not only a matter of professional behavior but also a spiritual duty before Allah. Through responsibility, Muslims can contribute not only to success in business life but also to the building of a more just and ethical society as a whole.

Professionalism, accuracy, precision, collegiality, teamwork, and taking responsibility are all interconnected and contribute to the development of an efficient and productive work environment. A culture of responsibility, in which standards and values are respected, lays the groundwork for achieving high results and further professional development for all team members. Responsibility also includes accepting the consequences that follow after performing a certain action, i.e., the readiness to take blame for a negative outcome or praise/reward for a positive outcome. Today, responsibility is a business imperative. Companies that behave irresponsibly in any segment lose their status in the market and, consequently, lose clients, directly jeopardizing their future business. In a world of constant, rapid, and profound changes, many institutions develop internal ethical codes, all with the goal of improving relationships and business practices.

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### SAŽETAK

Odgovornost u poslu predstavlja ključnu osobinu koja oblikuje ponašanje pojedinaca unutar radnog okruženja. Odgovornost je sveprisutna u čovjekovom životu, a smatra se da je to preuzimanje posljedica za svoje radnje. U poslovnom okruženju ona predstavlja osnovni faktor koji utiče na efikasnost, profesionalizam i međuljudske odnose na radnom mjestu. Ona se odnosi na sposobnost zaposlenih da preuzmu odgovornost za svoje zadatke, odluke i postupke, čime doprinosi efikasnom radu i stvaranju pozitivne radne atmosfere. Preuzimanje odgovornosti obuhvata ne samo ispunjavanje zadatah obaveza, već i sposobnost da se prepoznaju i isprave greške, kao i da se doprinosi ostvarivanju zajedničkih ciljeva. Odgovorno ponašanje doprinosi ne samo ličnom rastu, već i unapređenju organizacije kao cjelokupne poslovne jedinice. Odgovornost se veže za zakonsku regulative i moralne zakonitosti, a važan je dio poslovnih odnosa. Poslovna odgovornost je adekvatno obavljanje prihvaćenih poslovnih zadatah, a njezin je izvor u samome pojedincu. Ako pojedinac pristane na obavljanje poslovnog zadatka, preuzeo je i odgovornost za taj zadatak. Za preuzeti radni zadatak, odgovaran je nadređenoj osobi. U islamu, odgovornost u poslu smatra se ključnim aspektom lične etike, poštovanja i duhovnog integriteta. Islam postavlja visoke standarde kada je u pitanju odgovornost, bilo da se radi o ispunjavanju obaveza prema poslodavcu, kolegama ili zajednici. Islam naglašava da preuzimanje odgovornosti u svim životnim aspektima nije samo društvena ili profesionalna dužnost, već i duhovna odgovornost pred Allahom, dž.š. Slijedeći osnovne principe islama, zaposleni i poslodavci pozvani su da se ponašaju odgovorno, poštujući etičke norme koje doprinose izgradnji fer, pravednog i prosperitetnog društva. Odgovornost u svim segmentima poslovanja je imperativ savremenih organizacija, a oni koji praktikuju neodgovorno poslovanje osuđeni su na gubitak tržišta i loše poslovne rezultate. U ovom radu analizirat ćemo značaj odgovornosti u poslovnom okruženju, njene vrste, kao i načine kako razviti odgovornost kod zaposlenih, kao i stav islama prema odgovornosti svakog pojedinca. Također, analizirat ćemo i različite aspekte odgovornosti, uključujući profesionalnost, tačnost, preciznost, timski rad, kolegijalnost i preuzimanje odgovornosti, te kako ove osobine utiču na ukupnu produktivnost organizacije.

**Ključne riječi:** odgovornost, islamski aspekt, etika, poslovanje, menadžmenta, društvena odgovornost

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## JOURNAL OF HALAL QUALITY AND CERTIFICATION

### Research on Consumer Perception Towards Halal Products

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Professional paper 

#### ABSTRACT

The aim of this research was to analyze consumer perceptions, trust, and needs regarding halal products, with a focus on identifying key trends and obstacles. Survey results revealed a high level of awareness about the importance of halal certification, with 60% of respondents expressing full trust in labels, 30% partial trust, and 10% expressing doubts. The main motives for purchasing halal products include religious reasons (50%), health benefits (30%), and quality assurance (20%).

The age structure of respondents shows that the majority are between 30 and 50 years old (70%), while those over 50 years old make up 20%, and those under 30 years old account for only 10%. Regarding product availability, more than half of respondents (55%) find the range unsatisfactory, particularly in the meat and dairy product segments. These groups were highlighted as priorities for improving the offering. Respondents also suggested greater focus on consumer education and certification transparency.

Recommendations for improvement include developing specialized store shelves, increasing product diversity, and investing in marketing aimed at raising awareness of halal product benefits. Additionally, introducing extra controls and strengthening trust through education and public campaigns are proposed.

This research contributes to understanding consumer needs and can serve as a basis for further strategies to develop the halal product market, aiming to meet consumer expectations and strengthen trust in halal certification.

**Keywords:** consumer perception, consumer trust, halal products

#### Introduction

The growing demand for halal food is an opportunity for every country to compete and participate in the lucrative global halal market. In order to improve and develop halal products and

the halal industry, good marketing planning is of key importance, for which marketing information and forecasts and marketing organization are the most important (Dugonjić, 2019).

The aim of this research was to analyze consumer perceptions, trust, and needs regarding halal

products, with a focus on identifying key trends and obstacles

Halal products occupy a significant place in the global market of the food industry, especially in countries with a predominantly Muslim population. In addition to the religious aspect, halal certification ensures health and product quality, which attracts the wider population. The aim of this paper is to investigate consumer attitudes towards halal products, identify the main obstacles and offer recommendations for improving their availability. Muslims have more purchase intention to consume halal label/logo products (Widyanto and Sitohang, 2021). False information on the Halal logo leading to the loss of confidence and trust can affect their intention to purchase Halal products (Mohamed et al., 2020).

Trustworthiness in the institution for halal foods and beverages was the highest determinant in satisfaction (Alsan et al., 2023). Misleading halal certification and fake news or fabricated news leading to the loss of confidence, affecting intention to purchase halal products about the halal status of particular foods and beverages decrease the trust of costumers (Derahman et al., 2017).

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Consumption includes morality and spiritual intentions in Islam besides meeting satisfaction for one's needs, achieving God's pleasure and well-being ( Ekoyudho, 2021)

## Methodology

The survey was conducted via an online form and included questions related to trust in halal labels,

purchase motives, product availability and opportunities for improvement. The collected data was analyzed using quantitative methods to gain insight into the main trends and attitudes of the respondents.

The research was conducted through an online survey designed to collect data on consumer perceptions, trust, and needs regarding halal products. The survey questionnaire was divided into several thematic sections:

- **Demographic Data** (Age, gender, education, and economic status of respondents).
- **Trust in Halal Certification** (Questions about the level of trust in halal labels and perceptions of certification process transparency).
- **Buying Habits and Motives** (Reasons for purchasing halal products religious, health, and quality factors, purchase frequency, and the types of products most commonly bought).
- **Availability and Market Challenges:** Perception of product availability, difficulties in purchasing, and suggestions for improving the product range.
- **Education and Awareness** ( Knowledge of halal certification criteria and the need for additional consumer education).

Data was collected through a structured questionnaire created using the Google Forms platform. Respondents accessed the survey via distributed links on social media, email, and through networks of partner organizations.

The collected responses were analyzed using quantitative methods, applying descriptive statistics to identify key trends and behavioral patterns.

The research was conducted with 105 respondents.

## Results and discussion

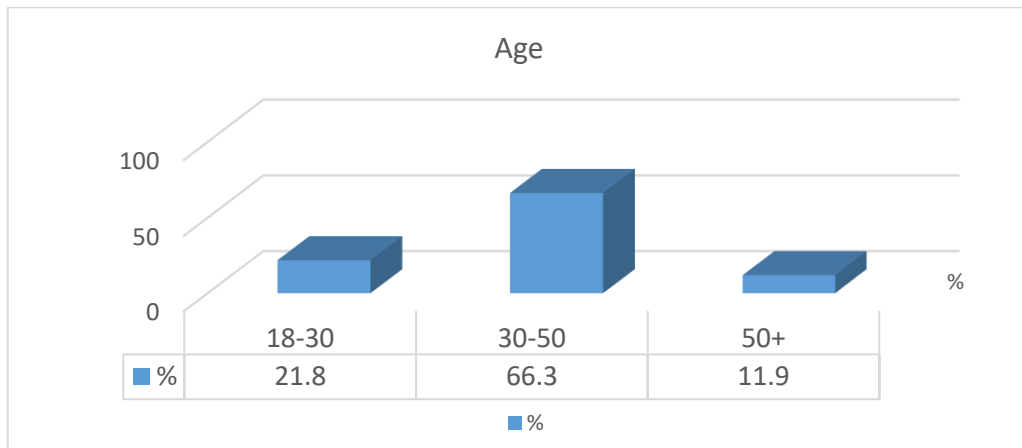


Figure 1 Age structure of respondents

The age structure of the respondents shows that the largest percentage (66.3%) are between 30 and 50 years old. A smaller proportion of

respondents (21.8%) belong to the 18 to 30 age group, while 11.9% are over 50 years old.

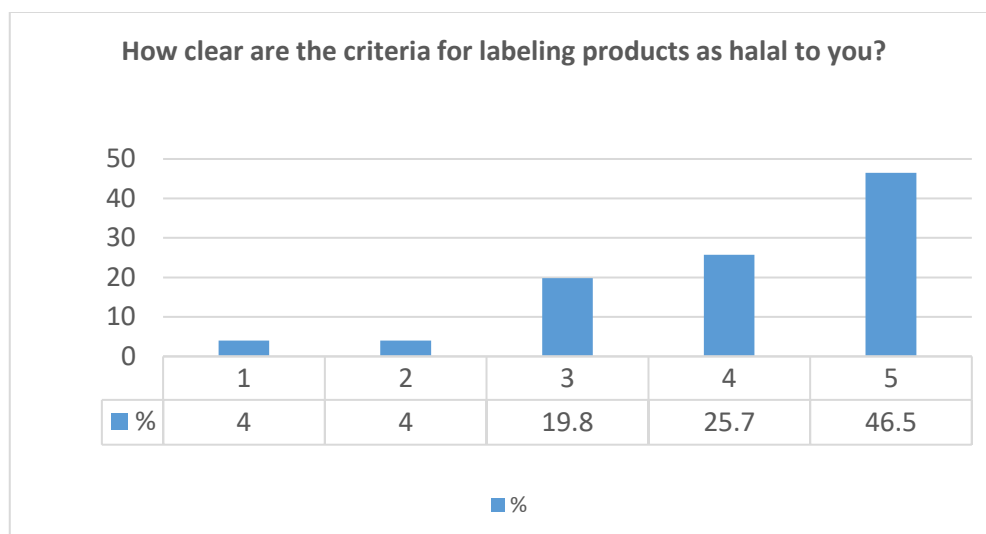


Figure 2 How clear are the criteria for labeling products as halal to you

**Knowledge of Halal Certification Criteria**  
 Respondents demonstrated a high level of knowledge regarding the criteria for halal product labeling, with 46.5% stating they are very familiar with the criteria, and 25.7% rated their knowledge as good. However, 4% of respondents felt the criteria were unclear. This indicates the need for greater consumer education, as a clearer

understanding of halal labeling could increase trust and motivate people to purchase halal products. Through additional marketing activities, such as informational materials and educational programs, the understanding of halal certification and its criteria could be improved.

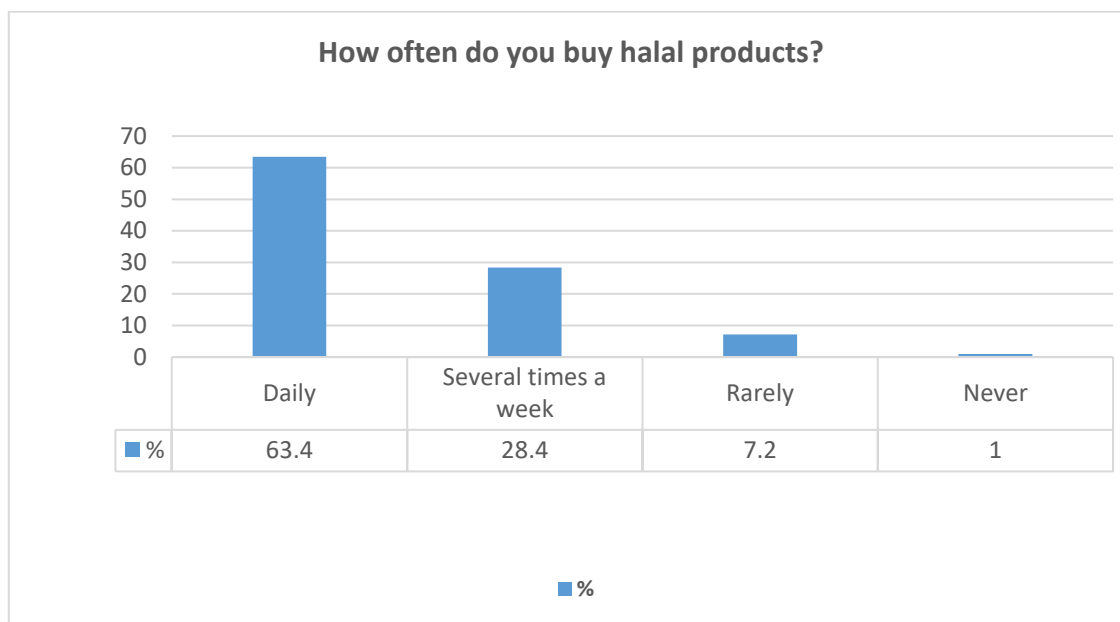


Figure 3 How often do you buy halal products?

**Frequency of Purchasing Halal Products**  
 Respondents showed a high frequency of purchasing halal products, with 63.4% buying halal products daily, and 24.8% purchasing several times a week. Only 1% of respondents never buy halal products. These data indicate a significant demand for halal products, which is

crucial for further market development. However, there appears to be potential to increase the frequency of purchases among those who buy rarely, which could be achieved through stronger promotion and better availability of halal products.

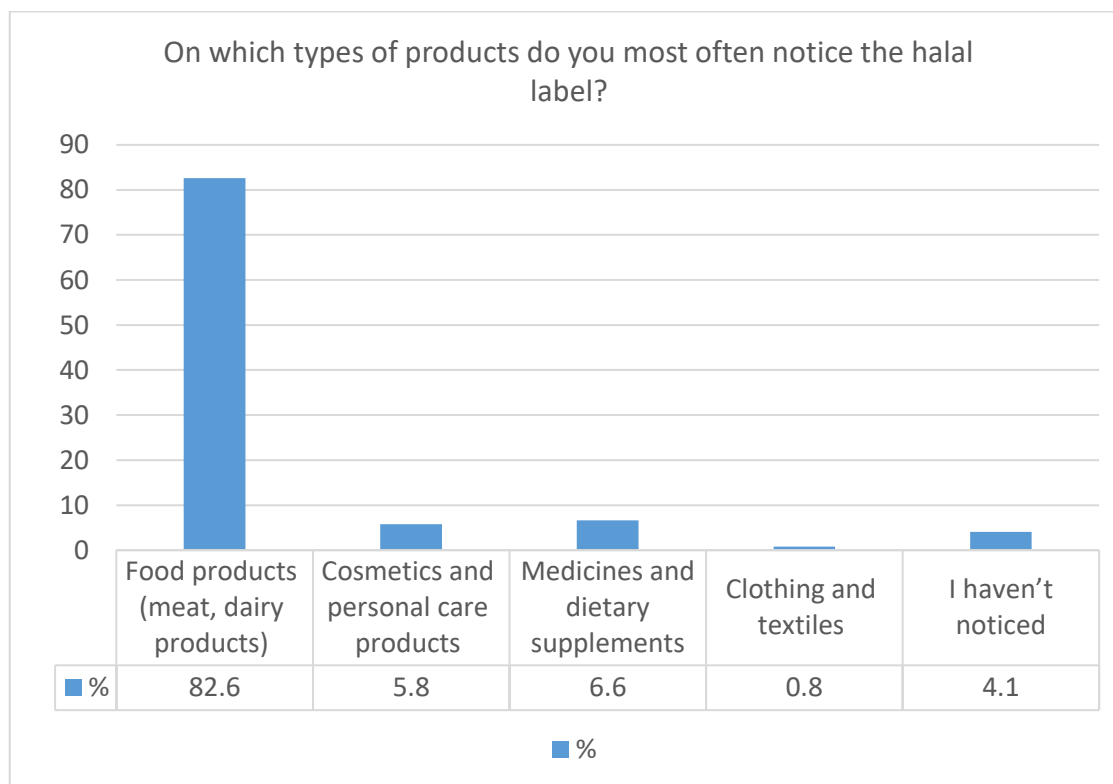


Figure 4 On which types of products do you most often notice the halal label?

Types of Products Where Halal Label is Most Commonly Seen According to responses, 82,6% of respondents most often notice the halal label on food products. A smaller percentage notices the halal label on clothing (0,8%), pharmaceuticals and dietary supplements (6,6%), and cosmetics and personal care products (5.8%). These results suggest that halal products

primarily belong to the food industry, while visibility in other sectors such as pharmaceuticals and cosmetics is lower. To expand the range of halal products, manufacturers should consider introducing halal certification in these sectors, which would further increase consumer interest and trust.

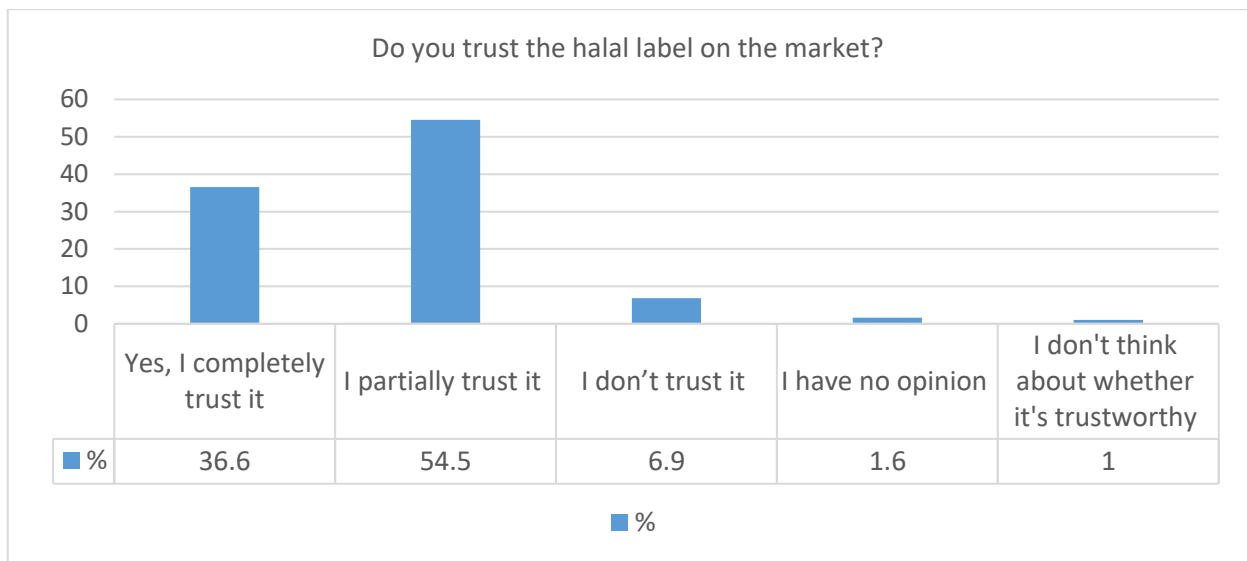


Figure 1 Do you trust the halal label on the market?

Trust in the Halal Label in the Market 36.6% of respondents completely trust the halal label, while 54.5% partially trust it. On the other hand, 6.9% of respondents do not trust the halal label. These results show a high level of trust in halal certification but also a certain percentage of

uncertainty. This uncertainty may stem from issues with the transparency of certification processes and doubts about product quality. There is a need to work on increasing the transparency of halal certification to reduce doubts and increase trust among consumers.

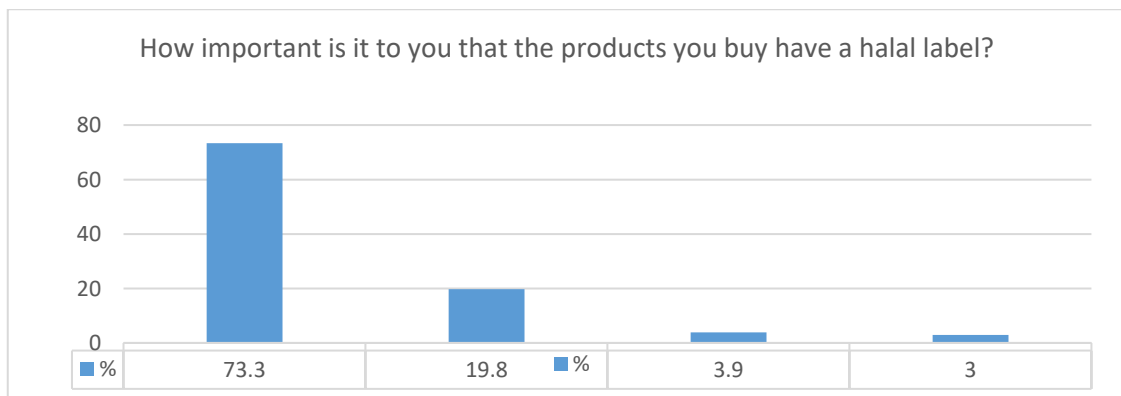


Figure 6 How important is it to you that the products you buy have a halal label?

**Importance of the Halal Label When Purchasing**  
 According to the results, 73.3% of respondents consider the halal label very important, while 19.8% consider it moderately important. Only 3% of respondents do not pay attention to the halal label. This shows that the majority of consumers place significant importance on halal certification

when choosing products. Consumers increasingly recognize halal products as safer and of higher quality, which can be leveraged for further development and promotion of the halal market.

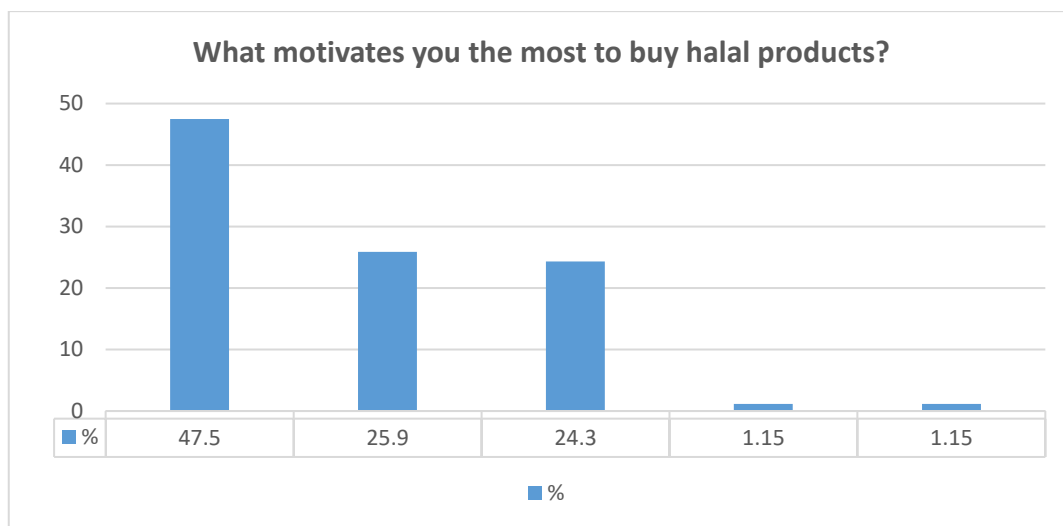


Figure 2 What motivates you the most to buy halal products?

**Motivations for Purchasing Halal Products**  
 Respondents most often cited religious reasons (47,5%) as their motivation for purchasing halal products, while health reasons (25,9%) and product quality and safety (24,3%) were also important factors. These results confirm that halal

food, in addition to meeting religious norms, is also recognized as a healthier option. Manufacturers could further emphasize the health benefits of halal products in marketing campaigns to attract a broader population.

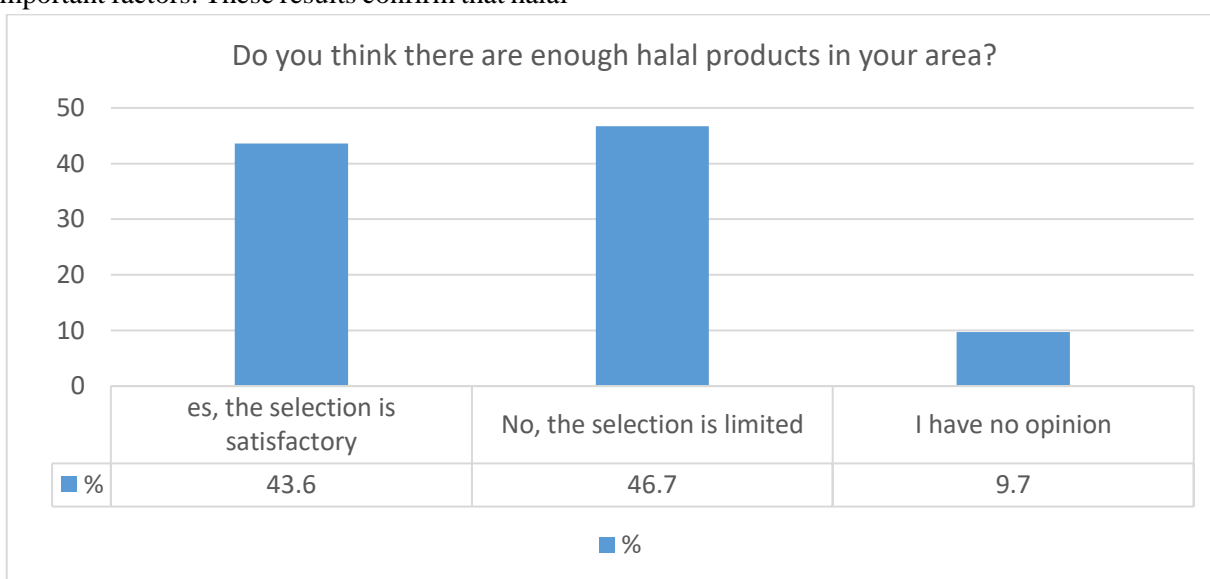


Figure 8. Do you think there are enough halal products in your area?

**Availability of Halal Products** Half of the respondents believe that the availability of halal products is unsatisfactory, while 43.6% consider the availability satisfactory. This result highlights the need to expand the range of halal products in stores to meet the growing market demand.

Specialized halal product shelves could help improve the availability and visibility of these products, which would increase their purchase.

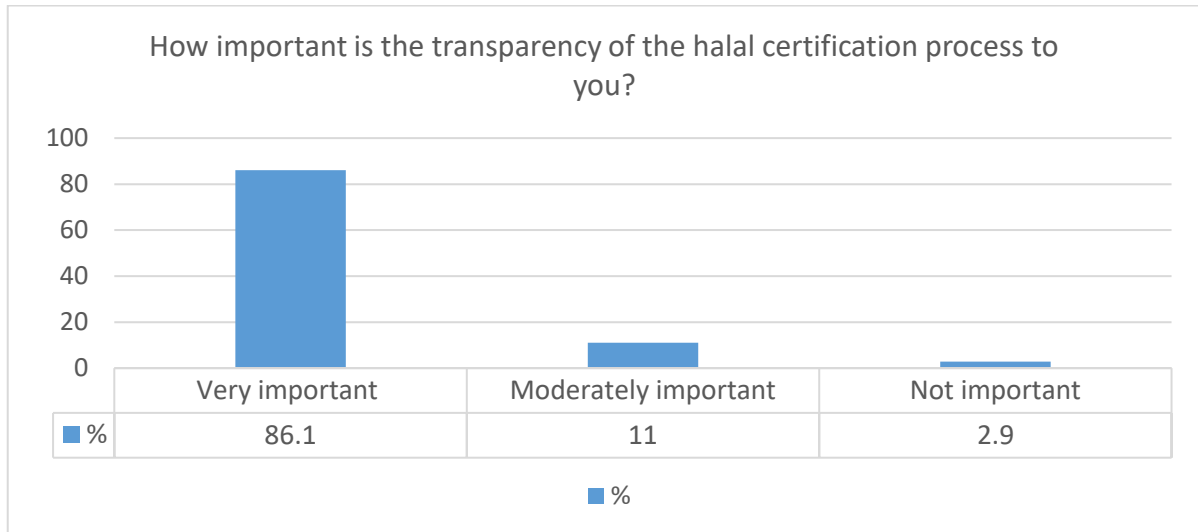


Figure 3 How important is the transparency of the halal certification process to you?

**Importance of Transparency in Halal Certification** 86.1% of respondents believe that transparency in halal certification is very important. This highlights the need for greater emphasis on clarity and transparency throughout

the certification process, including information about ingredients, production methods, and quality control. A clearer explanation of the certification process can increase consumer trust and reduce uncertainty regarding halal products.

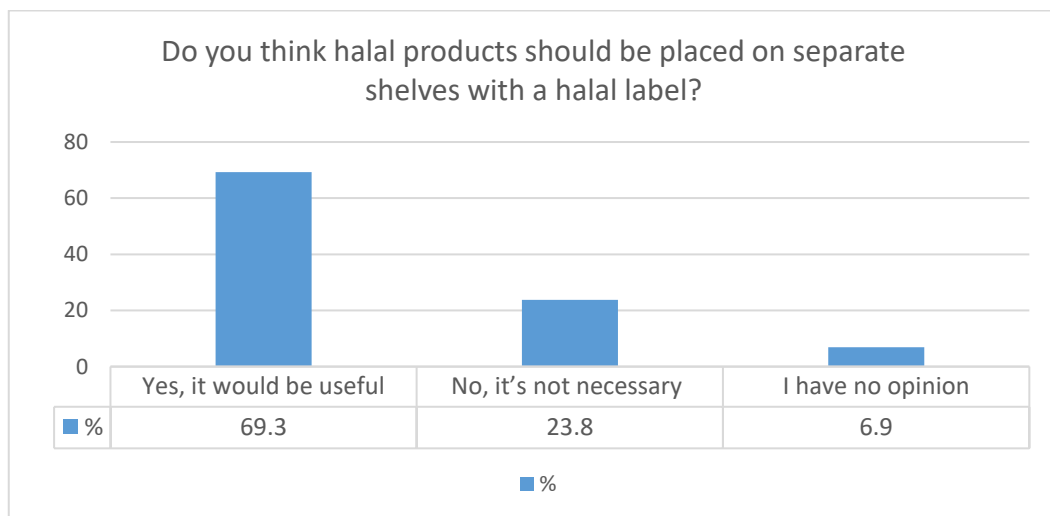


Figure 4 Do you think halal products should be placed on separate shelves with a halal label?

Special Shelves for Halal Products 69.3% of respondents believe that it would be useful to have dedicated shelves for halal products in stores. This would increase the visibility of halal products and make it easier for consumers to find these products. This suggestion aligns with trends in retail, where specialized sections for specific products help create clearer identities and greater demand.

**Increasing Demand for Halal Products: Key Steps for Market Improvement** In today's globalized market, halal products are experiencing significant growth, with their influence extending beyond the boundaries of Muslim communities.

Question "What types of halal products do you miss the most?"-free answer

According to the responses to the survey on the availability of halal products, the market shows a significant need for expanding the offering in several key categories. The majority of responses pertain to meat and meat products, which constitute the core of consumers' dietary habits. Although chicken is already available on the market, there is a need for greater availability of other types of meat, such as turkey, as well as meat products like burgers, ćevapi, and dry-cured meats(restaurants). Consumers also emphasize the importance of transparency in the slaughter process, meaning the meat must truly adhere to halal practices in line with Sharia law, not just be labeled as halal.

There is a significant demand for halal sweets, particularly those containing gelatin, such as gummy candies. This is a specific issue because gelatin must be plant-based or synthetic, not of animal origin.

In addition to food, there is a need for halal cosmetics, hygiene products such as toothpaste, and medicines that should comply with Sharia law. This demand is especially pronounced among consumers who wish to use products that are halal not only in food but also in everyday consumer goods.

The lack of halal-certified non-alcoholic beverages is also mentioned in the surveys,

indicating the need to expand the offering in this category.

Consumers also point to a broader need for halal versions of various food products, including dairy products, soups, spices, mayonnaise, instant coffee, chewing gum, and similar items. This suggests growing interest in halal-certified products across all segments of food.

## **Conclusion**

The halal market holds significant growth potential, not only as a religious concept but also as a market opportunity that meets the needs of diverse consumers seeking ethical, safe, and healthy products. To fully realize this potential, several key strategies must be implemented. Increasing the availability of halal products, consumer education, transparency in the certification process, support for local producers, and stronger marketing efforts can significantly contribute to growing demand.

One of the key steps to increasing the availability of halal products is the introduction of specialized shelves in stores. Dedicated spaces for halal products would provide consumers with easier access and better visibility, attracting a wider audience, not only consumers from Muslim communities but also those seeking products that support a healthier lifestyle. Specialized sections would allow halal products to become an integral part of the broader offering, thus increasing their availability and recognition.

Consumer education plays a crucial role in increasing demand for halal products. It is essential to ensure that consumers are better informed about what halal means and the benefits these products offer, enabling them to make educated purchasing decisions. Transparency in the certification process is also vital for building consumer trust. Clear communication about what halal certification entails, including production, packaging, and storage standards, will ensure that consumers can trust the products they purchase.

The halal market extends beyond food to include cosmetics, pharmaceuticals, and financial services that comply with Sharia principles. Developing these services, such as halal loans,

insurance, and investments, can significantly contribute to the market's expansion, creating a new segment that connects halal products with broader social and economic activities.

Encouraging local producers to obtain halal certification is essential for diversifying the halal product range. Local producers often benefit from lower production costs and faster distribution, which enables competitive pricing. Providing subsidies or other forms of assistance to help local producers transition to halal production can accelerate market growth. Continuous education for producers about the value of halal certification and its positive impact on market recognition and demand can motivate them to adopt halal standards.

To raise the profile of halal products, a strong marketing strategy is necessary. Advertising campaigns should highlight the quality, safety, and ethical aspects of halal product production. Using social media and digital platforms to promote these products, especially through educational content, can help reach a broader audience, particularly younger generations. Innovative marketing tactics, such as video content that explains the halal production process, can make halal products more appealing to a wider consumer base.

The visibility and reliability of the halal label are key factors that need to be improved. Consumers require clear and recognizable labels that allow them to easily identify halal products. Introducing standardized, globally recognized symbols for halal products can help eliminate confusion. Additionally, providing clear guidelines on what qualifies as halal—including ingredients, packaging, and production methods—can build consumer trust and reduce doubts about the authenticity of halal products.

In conclusion, with the right strategies, the halal market can become a key segment of the global industry, offering products that meet the needs and values of a growing and diverse consumer base.

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## Istraživanje percepcije potrošača prema halal proizvodima

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### SAŽETAK

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Cilj ovog istraživanja bio je analizirati percepciju, povjerenje i potrebe potrošača u vezi s halal proizvodima, s naglaskom na identifikaciju ključnih trendova i prepreka. Rezultati ankete pokazali su visok nivo svijesti o važnosti halal certifikacije, pri čemu je 60% ispitanika izrazilo potpuno povjerenje u oznake, dok je 30% djelomično vjerovalo, a 10% izrazilo sumnju. Glavni motivi za kupovinu halal proizvoda uključuju vjerske razloge (50%), zdravstvene benefite (30%) i osiguranje kvalitete (20%).

Dobna struktura ispitanika pokazuje da većinu čine osobe između 30 i 50 godina (70%), dok stariji od 50 godina čine 20%, a mlađi od 30 godina samo 10%. Što se tiče dostupnosti proizvoda, više od polovine ispitanika (55%) smatra ponudu nezadovoljavajućom, posebno u segmentima mesnih i mliječnih proizvoda. Ove grupe su istaknute kao prioritetne za poboljšanje ponude. Ispitanici su također predložili veći fokus na edukaciju potrošača i transparentnost certifikacijskih procesa.

Preporuke za poboljšanje uključuju razvoj specijaliziranih polica u trgovinama, povećanje raznolikosti proizvoda i ulaganje u marketing usmjeren na podizanje svijesti o prednostima halal proizvoda. Osim toga, predlaže se uvođenje dodatnih kontrola i jačanje povjerenja kroz edukaciju i javne kampanje.

Ovo istraživanje doprinosi razumijevanju potreba potrošača i može poslužiti kao temelj za daljnje strategije razvoja tržišta halal proizvoda, s ciljem zadovoljenja potrošačkih očekivanja i jačanja povjerenja u halal certifikaciju.

**Ključne riječi:** percepcija potrošača, povjerenje potrošača, halal proizvodi

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