İstanbul Zaim Üniversitesi
HELAL VE ETİK ARAŞTIRMALAR DERGİSİ JOURNAL OF HALAL AND ETHICAL RESEARCH
https://dergipark.org.tr/tr/pub/head

THE ROLE OF ISTIHALAH (TRANSFORMATION) AND ISTIHLAK (CONSUMPTION) IN THE PERMISSIBILITY OF VACCINES DERIVED FROM FORBIDDEN ORIGINS: AN ISLAMIC LAW PERSPECTIVE

Abduul Moben AMIN* Hacı Mehmet GÜNAY

Sakarya Üniversitesi, İlahiyat Fakültesi, Temel İslam Bilimleri Bölümü, İslam Hukuku Anabilim Dalı, Sakarya, Türkiye

MAKALE BİLGİSİ

Geliş tarihi: 5 Ağustos 2023
Düzeltme tarihi: 26 Ağustos 2023
Kabul tarihi:28 Ağustos 2023

Keywords:
Istihalah, Istihlak, Vaccines, Cell Lines, Porcine, Permissibility, Islamic Bioethics, Medical Ethics.

ABSTRACT

The emergence of pandemics presents significant challenges to global health, economies, and societies at large. In such critical circumstances, the development and widespread adoption of effective vaccines are of utmost importance to protect lives, improve population health, and restore social and economic stability. Islamic jurisprudence, with its emphasis on the preservation of life and the well-being of individuals, plays a crucial role in influencing the acceptance and utilization of vaccines within societies that predominantly adhere to the Islamic faith. This article explores the role of two significant concepts in Islamic jurisprudence, namely Istihalah and Istihlak, in determining the permissibility (halal) of vaccines derived from sources that are considered haram. Focusing on materials such as animal tissues, human fetal tissues, pig gelatin, and alcohol, which may raise concerns regarding their compliance with Islamic teachings, this article investigates the processes of transformation and purification involved in the production of such vaccines. This article provides a comprehensive analysis of the permissibility of vaccines derived from haram sources, drawing upon a wide range of scientific opinions, fatwas (religious decrees), classical and contemporary Islamic legal texts, and scientific research. It highlights that the prevailing view among the fatwa councils and the majority of Islamic scholars is that such vaccines are considered halal (permissible). Extensive research demonstrates that the 57 member countries of the Organization of Islamic Cooperation (OIC) exhibit a strong commitment to combating infectious diseases through the prioritized utilization of vaccines. Again, this article adopts a multidisciplinary approach encompassing scientific knowledge, bioethics, and Islamic jurisprudence to elucidate the alignment of vaccination methods with Islamic principles. The principal aim of this study is to enhance the informed decision-making process for healthcare professionals, policymakers, and religious leaders by furnishing them with invaluable insights.

İSLAM HUKUKU AÇISINDAN HARAM KÖKENLİ KATKILARLA ÜRETİLEN AŞILARIN MÜBAH OLMASINDA İSTIHALE VE İSTİHLAK'IN ROLÜ

Anahtar Kelimeler:
İstihale, İstihlak, Aşı, Hücre Dizileri, Domuz, Mübah, İslami Biyoetik, Tıp Etiği.

ÖZET

Hayvan veya insan cenin dokuları, domuz jelatini ve alkol gibi İslami öğretilere uygunluğu konusunda endişe yaratabilecek malzemelerle aşı üretimine odaklanan bu makale, haram kaynaklardan üretilen bu tür aşılarda meydana gelen dönüşüm ve saflaştırma süreçlerini incelemektedir. Bu makale, çok çeşitli bilimsel görüşler,

***Sorumlu Yazar:** Abduul Moben AMIN, E-mail: abdulmoben.amin@gmail.com **Orcid:** https://orcid.org/0000-0002-7173-8745
Hacı Mehmet GÜNAY, E-mail: hmgunay@gmail.com **Orcid:** https://orcid.org/0000-0001-8844-6338

fetvalar (dini hükümler), klasik ve çağdaş İslami hukuk metinleri ve bilimsel araştırmalardan yararlanarak haram kaynaklardan elde edilen aşıların caiz olup olmadığına dair kapsamlı bir analiz sunmaktadır. Fetva meclisleri ve İslam alimlerinin çoğunluğunda hâkim olan görüş, bu tür aşıların helal olduğu yönündedir. Kapsamlı araştırmalar, İslam İş birliği Teşkilatı'na (İİT) üye 57 ülkenin, aşıların öncelikli kullanımı yoluyla bulaşıcı hastalıklarla mücadelede güçlü bir kararlılık sergilediğini göstermektedir. Yine bu makale, aşı uygulama yöntemlerinin İslami ilkelerle uyumluluğunu aydınlatmak için bilimsel bilgi, biyoetik ve İslami hukukunu da kapsayan multidisipliner bir yaklaşımı benimsemektedir. Çalışmada birincil amaç, sağlık uzmanlarına, politika yapıcılara ve dini liderlere değerli bilgiler sunarak bu konuda daha bilinçli karar verilmesine katkıda bulunmaktır. Çalışmada ikincil amaç ise yine tüm ilgililere değerli bilgiler sunarak dahabilinçli karar verilmesini teşvik etmek ve Müslümantopluluklar arasında aşıların kabulünü desteklemektir.

1. Introduction

In the contemporary globalized world, the manufacturing and distribution of diverse commodities, including vaccines, are entangled within intricate supply chains encompassing distinct nations and cultures (Mardian et al. 2021:1–2). Among Muslims, the matter of halal compliance concerning haram products has emerged as a significant apprehension. Halal pharmaceuticals, in the pharmaceutical industry, refer to products that comply with the requirements set by Islamic law. A halal pharmaceutical product must adhere to be free from any components or derivatives derived from animals that are considered non-halal according to Islamic law, or were not slaughtered in accordance with Islamic practices or it must not contain impure (najs) substances (Department of Standards Malaysia (Standards Malaysıa) 2012; Jabatan Kemajuan Islam Malaysia (Jakim) 2014). According to Islamic law, the pig is considered a non-halal animal. Hence, the inclusion of any parts or derivatives of pigs in medicinal products renders them impermissible for consumption by Muslims (Mardian et al., 2021). Same applies to vaccines which are containing ingredients of animal origin or those produced through non-Islamic methodologies. The Islamic jurisprudence places considerable emphasis on the sanctity of life and the preservation of livelihood, thereby necessitating a thorough examination of the Islamic standpoint regarding the permissibility (halal) of vaccines derived from haram sources (Ahmed et al., 2018, Anon n.d.-e; WanRohani, 2017).

This paper aims to investigate the role of istihalah (transformation) and istihlak (consumption) in the determination of the permissibility of vaccines derived from haram sources, from the perspective of Islamic law. Istihalah refers to the transformation or alteration of substances during chemical or biological processes, while istihlak refers to the process in which a small quantity of impure (najis) or prohibited (haram) substance mixes with a larger quantity of pure (tâhir) substance and it dissipates within it. These concepts play a significant role in determining the permissibility of vaccines derived from haram sources.

Additionally this research examines the existing literature, fatwas (Islamic legal opinions), and scientific discourse concerning the utilization of vaccines that contain substances deemed haram. It also explores the principles of pure (Tayyab) and impure (khabis) within Islamic dietary laws and their implications for Vaccine manufacturing. Furthermore, legal and ethical considerations associated with the use of vaccines that have undergone conversion and purification processes are thoroughly examined. Gaining an understanding of the Islamic perspective on the permissibility of vaccines

holds significant importance in providing information and guidance to Muslims, including muftis, religious leaders, and healthcare professionals, regarding matters of vaccine acceptance and religious observance. Through an examination of the principles of istihalah (transformation) and istihlak, this article aims to contribute to ongoing discussions and endeavors aimed at ensuring the accessibility of halal vaccines for the Muslim community. Additionally, it aims to address potential concerns or misconceptions associated with this topic.

This article will offer valuable insights and guidance to stakeholders engaged in the domains of vaccine development, regulation, and administration. Moreover, it aims to contribute to a comprehension of the interplay between Islamic law, medical ethics, and public health within the context of vaccines, specifically focusing on the aspects of halal acceptance and compliance.

Literature Review

Previous independent research on the transformation and consumption of haram components of vaccine has either not been conducted, or we have not encountered such studies. However, valuable research has been carried out on the general and independent aspects of transformation, consumption, and rulings related to vaccines. Below, we mention some of these studies in chronological order:

The article by Yasin bin Nasser al-Khatib titled "Istihalah and its Rulings in Islamic Jurisprudence" (2003) primarily focuses on the concept of the human's action affecting the transformation of substances and elaborates on the viewpoints of various jurisprudential schools in detail. However, in this article, the effects of the transformation and high consumption of haram substances in the production of vaccines will be discussed from a medical and jurisprudential perspective.

The book "Food Additives: Problems and Solution Suggestions/Gıda Katkı Maddeleri: Sorunlar ve Çözüm Önerileri" is a compilation of a symposium organized by the Halal and Healthy Food Platform in Ankara on November 19-20, 2011. Among the valuable research presented in this book, there are discussions on the transformation and consumption of foods. However, there is no mention of the transformation and consumption of vaccines with haram origins, as it falls outside the scope of the title.

The article by Muneer Ali Abdul Rab titled "The Current Issues of Transformation on Cosmetic and Cleaning Products: Jurisprudential Study" (2015) solely discusses the general rulings concerning the use of haram substances in cleaning and cosmetic products. However, the article we intend to undertake focuses specifically on vaccines and addresses their particular aspects with regard to transformation.

The article by Yunus Naci Cibiz titled "Istihlak and Their Judgements in Islamic Law/ İslam Hukukunda İstihlâk ve Hükümleri" (2015) discusses the definition and nature of consumption (istihlak), the difference between transformation (istihalah) and consumption, and the effects of consumption in jurisprudential rulings. However, we will specifically examine the effects of transformation and consumption of haram substances used in the production of vaccines from both a medical and jurisprudential perspective.

The article by Abdurrahman Candan titled "The Canonically Lawful (Istihalah) in the Fiqh Texts from the Verifiable Principles of the Point of View and Current Findings/ Doğrulanabilirlik İlkesi Açısından Fıkıh Literatüründeki İstihâle Örnekleri ve Güncel Bazı Tespitler" (2017) discusses the definition of istihalah (transformation) and explores its application to various substances such as impure water, animal skins, wine,

impure oils, blood, and urine. However, our discussion focuses on the role of transformation and consumption (istihalah and istihlak) of haram substances used in the production of vaccines, such as human and animal cell cultures, porcine trypsin, porcine gelatin, and alcohol.

The article by Hüseyin Baysa titled "The Effect of Istihlak on the Provision of Ḥaram-containing Product/Haram Madde İçeren Ürünlerin Hükmüne İstihlâkin Etkisi" (2018) examines the provisions related to the utilization of haram items in the food, nutrition, cosmetic, hygiene, and apparel industries, which have been subjected to consumption (istihlak).

The book "II. International Symposium on Integrity of Tradition and Knowledge in Social Science/ II. Uluslararası Sosyal Bilimlerde Gelenek ve Bilgi Bütünlüğü Sempozyumu" was organized by Istanbul Sabahattin Zaim University on July 11-12, 2019. The conference included discussions on the topics of transformation (istihalah) and consumption (istihlak) and presentations on the subject of transformation of impure substances (najis).

The article by Yüksel Çayiroğlu titled "Evaluating Alcohol-Containing Foods In Terms of Fiqh/ Alkol Katılan Gıdaların Fıkhî Açıdan Değerlendirilmesi" (2020) solely focuses on the issue of alcohol and the effects of its transformation and consumption. However, in this article, not only the role of transformation and consumption of alcohol but also other haram substances used in the production of vaccines will be discussed.

In terms of the fiqh rulings of vaccines, various research has been conducted on their voluntary application and compulsory implementation by governments. Below, we provide several examples of these research studies.

The article by Maryam Abdulrahman Al-Ahmad, titled "The Ruling of State Compelling its Subjects to Vaccinate in Islamic Jurisprudence" (2019) discusses the jurisprudential rulings regarding the state's mandate of vaccination, the ruling on seeking medical treatment in Islam, and the legitimacy of preventive treatment in Islam.

The article by Azizah bint Saeed bin Mu'ayyid, titled "Vaccination: A Jurisprudential Study" (2020) discusses the significance and history of vaccines, the ruling on obtaining vaccines and the priorities in vaccine administration from a jurisprudential perspective.

The article by M. Asrorun Niam Sholeh and Muhammad Ishar Helmi, titled "The COVID-19 Vaccination: Realization on Halal Vaccines for Benefits" (2021) discusses the rulings on the compatibility of vaccines with permissible ingredients (halal) and deems it permissible to use vaccines containing haram substances in times of necessity based on valid reasons and purposes in Islamic jurisprudence. However, the article does not address the issue of transformation and consumption (istihalah and istihlak) of these substances.

As mentioned above, the article discusses the role of transformation and consumption (istihalah and istihlak) of haram substances, such as human and animal cell cultures, porcine gelatin, porcine trypsin, alcohol, and other haram materials used in the production of vaccines. It is worth noting that the article first presents the necessary materials for the structure of the vaccine and subsequently examines the additional materials added during various stages of vaccine production. It addresses the question of whether the addition of these materials during multiple stages of the vaccine retains their original properties or undergoes changes. The article further explores the process of transformation and consumption (istihalah and istihlak) and its

jurisprudential nature, taking into consideration the impact of high transformation and consumption on other fiqh rulings, and eventually reaches its final conclusions.

2. Vaccine Manufacturing Process and Their Ingredients

2.1. Vaccine Manufacturing Process

The manufacturing process of vaccines occurs within a meticulously controlled environment that is subject to stringent regulations at both national and international levels. Compliance with Good Manufacturing Practices (GMP) specifications is a fundamental requirement. The vaccine production process involves four primary steps:(Gomez and Robinson, 2018; Ministry of Health Malaysia (MOH) and Department of Islamic Development Malaysia (JAKIM) 2015).

1. Propagation: This step involves the multiplication or reproduction of the organisms or pathogens used in the vaccine. Pathogen proteins or DNA are cultivated and harvested in growth media, primary cells, or cell lines (Anon n.d.-f; Josefsberg and Buckland 2012:1450; Ministry of Health Malaysia (MOH) and Department of Islamic Development Malaysia (JAKIM) 2015).

2. Isolation: In this step, the organisms are separated from the cells (in the case of viral vaccines) or the culture medium (in the case of bacterial vaccines) used in the propagation process (Anon n.d.-f; Ministry of Health Malaysia (MOH) and Department of Islamic Development Malaysia (JAKIM) 2015).

3. Purification: The purification step aims to remove any substances that may be adhering to the isolated organisms, ensuring a vaccine product of high purity and quality. This step also includes processes such as inactivation of microorganisms and conjugation of polysaccharides.

4. Formulation: During the formulation stage, the purified product is mixed with appropriate solutions to achieve the desired concentration. Components such as diluents, preservatives, excipients, and stabilizers are added to the mixture (Anon n.d.-f; Josefsberg and Buckland, 2012; Ministry of Health Malaysia (MOH) and Depart- ment of Islamic Development Malaysia (JAKIM) 2015). This step also involves the combination of other antigens to create specific vaccines, such as the MMR (measles, mumps, and rubella) and DTaP (diphtheria, tetanus, and pertussis) vaccines (Gomez and Robinson, 2018).

5. After formulation, the final product is packaged and shipped for distribution (Gomez and Robinson 2018).

2.2. Ingredients of Vaccines

The ingredients of vaccines can be different depending on the specific vaccine and its formula. It is important to note that the presence and amount of ingredients may vary between different vaccines and manufacturers (Canada, 2007a).

2.2.1. Active components: Active ingredients can be antigens, inactivated viruses, live viruses, purified viral proteins, inactive bacterial toxins, or bacterial polysaccharides that stimulate the immune system to produce antibodies. Suspension liquids can include saline, sterile water, or liquids containing proteins (Anon n.d.-b; Etiler, 2018; Offit and Jew, 2003).

2.2.2. Adjuvants: Adjuvants are substances used alongside bacterial and viral components to enhance the specific response to antigens (Garçon and Friede, 2018). Additionally, adjuvants are included in vaccines to enhance the duration of B and T cell activation, thereby strengthening the resulting immune response. An adjuvant allows for a decrease in the amount of antigen required per dose or the total number of doses

needed to provide immunity, and it helps improve the immune response in individuals with some degree of immunosuppression (e.g., elderly individuals) (Canada, 2007b; Garçon and Friede, 2018).

Newly developed vaccines utilizing recombinant, biosynthetic, and other modern technologies require adjuvants (Egan and Finn, 2018; Garçon and Friede, 2018). Currently, some adjuvants in use include:

• Aluminum salts (aluminum hydroxide, aluminum phosphate, or aluminum hydroxyphosphate sulfate).

• AS01B (3-O-desacyl-4'-monophosphoryl lipid A [MPL], Quillaja saponaria Molina fraction 21 [QS-21], cholesterol, dioleoyl phosphatidylcholine [DOPC], anhydrous disodium phosphate, potassium dihydrogen phosphate, sodium chloride, water for injection).

• AS04 (3-O-desacyl-4'-monophosphoryl lipid A adsorbed onto aluminum [as a hydroxide salt]).

• MF59 (an oil-in-water emulsion consisting of squalene as the oil phase stabilized with polysorbate 80 surfactants and sorbitan trioleate in a citrate buffer) (Canada, 2007b).

2.2.3. Stabilizers: Stabilizers are substances added to vaccine vials to maintain the stability of vaccines until they are administered and to protect them from adverse conditions such as extreme cold or heat (Egan and Finn, 2018; Offit and Jew, 2003). For example, additives such as potassium or sodium salts, lactose, and polysorbate help control the product acidity (pH) and preservethe quality of vaccine antigens (Canada, 2007b). These may include amino acids like glycine and monosodium salt of glutamic acid, sugars such as lactose and sucrose, andproteins like gelatin or human serum albumin (Egan and Finn, 2018).

2.2.4. Preservatives: Preservatives can be defined as compounds that kill or inhibit the growth of microorganisms, especially bacteria and fungi. They are used in vaccines to prevent microbial growth in cases where multi-dose vials are pierced repeatedly with a needle or in the event of accidental or incidental contamination of the vaccine. In some cases, preservatives are added during the production process to prevent microbial growth. However, advancements in manufacturing technology have significantly reduced the need for the addition of preservatives during the production process (Egan and Finn, 2018; Wilson, 1967). Preservatives commonly used in vaccines include phenol, formaldehyde, 2-phenoxyethanol, benzethonium chloride, ethyl mercury and thiomersal (Egan and Finn, 2018).

2.2.5. Emulsifiers: Emulsifiers are materiales used to spread the active ingredients evenly throughout the vaccine and ensure consistent distribution. Polysorbate 80 is a common emulsifier in vaccines.

2.2.6. Other Excipients: Vaccines may also contain other adjuvants such as antibiotics (eg, Neomycin, polymyxin B, gentamicin and kanamycin) to prevent bacterial contamination during the manufacturing process, pH adjusters to maintain the desired properties of the vaccine formulation (Diseases 2018).

Products used during vaccine production can theoretically be found in the final product and are considered potential trace vaccine components (Pollard and Bijker 2021:83–100). For example, formaldehyde is widely used for inactivation in the manufacture of human and animal vaccines, such as those against polio, hepatitis A, enterovirus 71 and influenza viruses (Wilton et al., 2014). Formaldehyde is present in the final product at trace or very low levels and does not pose a safety concern (Center for Biolog- ics Evaluation and Research, 2023). Adju-

vants, preservatives, emulsifiers (polysorbate 80) or stabilizers (gelatin or sorbitol) are added to the vaccine to increase immunogenicity (Kocourkova et al., 2017). These added ingredients are usually present in very small quantities (Mardian et al., 2021).

2.3. Forbidden (Haram) Ingredients in Vaccines

Some ingredients added during a vaccine manufacturing process can potentially raise concern among end-users. They are described in the following paragraphs:

2.3.1. Gelatin: Gelatin is a substance commonly used as a stabilizer in many vaccines. It is derived from animal collagen, specifically from pigs or cows. According to a gelatin manufacturer in Europe, 80% of the gelatins available in the market are derived from pig skin, 15% from bovine serosa within the intestine, and 5% from the bones of pigs, cows, and other animals, including fish. Some vaccines that use porcine gelatin include Haemophilus influenzae, Japanese encephalitis, MMR, varicella, DTaP, and varicella-zoster vaccines (Anon n.d.-c; Canada, 2007b; Mardian et al., 2021).

2.3.2. Trypsin: Trypsin is a type of proteolytic enzyme used to hydrolyze esters and amides from protein network. It is produced from the pancreas of pigs for this purpose. Trypsin can also be derived from pancreas of cows and other mammals (Anon n.d.-c; Canada, 2007b; Mardian et al., 2021). Porcine trypsin is employed as a reagent during the propagation stage in the manufacturing of specific vaccines (European Medicines Agency 2013; Grabenstein 2013), such as inactivated polio and Japanese encephalitis vaccines. Its primary function is tofacilitate the removal or detachment of cellsfrom the vessels or culture tanks before the harvest. Additionally, porcine trypsin is utilized during the final culture phase of virus production to activate vaccines like influenza virus and rotavirus. While recombinant (semi-synthetic) trypsin is commercially available, porcine trypsin remains commonly utilized due to its cost-effectiveness compared to the recombinant alternative. Prior to further processing, harvested cells are subjected to thorough washing procedures to ensure the complete removal of porcine trypsin. Moreover, its presence is typically assessed through testing in the final vaccine product. Validation studies conducted on the removal process have consistently shown that the final vaccine product contains minimal to undetectable levels of porcine trypsin (European Medicines Agency 2013; Grabenstein 2013). It should be highlighted that vaccines are typi cally administered only a few times through-out an individual's lifetime to provide protection against specific diseases. This distinguishes vaccines from other pharmaceutical products, which may require lifelong treatment and repeated exposure to the ingredients of the product.

2.3.3. Animal serum: Animal serum are nutrient-rich growth media obtained from pigs, calves, horses, rabbits, and other animals (Khoo et al., 2019).

2.3.4. Human serum albumin: Some vaccines may contain components derived from human blood that is used as a stabilizer for the smallpox vaccine (Canada, 2007a).

2.3.5. Human cell lines: For some vaccines, the active ingredient must be cultivated in laboratory settings that involve human cell lines. This is due to the fact that viruses are specific to humans and can only grow in human cells. Once cultivated, the viruses undergo several purification steps to remove any human cellular material. This reduces the likelihood of human material being present in the final vaccine. Human cell lines

are used in the cultivation of viruses for certain vaccines in some countries (Anon n.d.-g). These include:

• The measles component of both MMR vaccines (MMRVaxPro and Priorix).

• The shingles vaccine (Zostavax).

• Both chickenpox vaccines (Varivax and Varilrix) (Canada, 2007a).

The cancer cells taken from Henrietta Lacks' cervix in 1952 have made significant contributions to numerous medical advancements, thanks to their use by Johns Hopkins University. In 1962, another anonymous woman's fetus was subjected to abortion in Sweden, and the aborted fetus's lungs were examined at the Karolinska Institute in Stockholm. Leonard Hayflick established the WI-38 cell line at the Wistar Institute in Philadelphia. This cell line, comprised of normal human cells that have been replicated multiple times, provides an excellent environment for the production of vaccines against viruses such as measles, rabies, and mumps (Wadman, 2017). Additionally, the MRC-5 cell line, derived from a fetus subjected to abortion in the United Kingdom in 1966, is also available (Anon., n.d.-d).

The cell lines used are referred to as WI-38 and MRC-5 using a small amount of lung cells obtained from two aborted fetuses. The abortions were legal and accepted by the mothers, but they were not conducted for the purpose of vaccine development. The original fetal cells have long since depleted. Because these cell lines still exist nearly 50 years later, there is no need for additional fetuses to cultivate these vaccine viruses (Offit and Fisher 2018).

Companies that utilize these cell lines, such as Merck, have explicitly stated that no new tissue has been added for over fifty years in the preparation of vaccines. It is mentioned that almost nothing of the original cells remains, stating the DNA (deoxyribonucleic acid) particles still present in the vaccine might be at the nanogram level, perhaps one billionth of a gram. This amount found in fruits and vegetables that we eat. The DNA (deoxyribonucleic acid) is obtained from the plant cells that make up the tissues of these organisms. (News, n.d.) Many individuals, including the Oxford Vaccine Group, support this view and have provided a detailed explanation of the process, which is mentioned exactly in the text below (Anon., n.d.-g).

Each batch of vaccines made using the WI-38 and MRC-5 cell lines is tested for the presence of residual human DNA. These tests are capable of detecting even tiny amounts of DNA. The results have shown that the levels of DNA in the vaccines are extremely low, on the order of nanograms. By comparison, an average human has about 100,000 nanograms of DNA in a single cell. Therefore, the amount of residual human DNA present in vaccines is significantly less than the amount of DNA naturally occurring in our bodies. The World Health Organization, regulatory authorities, and independent expert groups have extensively reviewed the use of these cell lines in vaccine production and concluded that the benefits of vaccines outweigh any theoretical risk associated with residual DNA. (News, n.d.)

2.3.6. Animal Cell Lines: Some vaccines require the cultivation of viruses on animal cell lines in laboratory settings. This is because viruses can only grow in human or animal cells (Anon., n.d.-g). In some countries, animal cell lines are used for the following vaccines:

• The polio component of the 6-in-1 vaccine (Infanrix Hexa).

• The polio component of preschool booster vaccines (Repevax, Infanrix IPV, and Boostrix-IPV).

• The polio component of adolescent booster vaccines (Revaxis).

• Nasal spray flu vaccine (Fluenz).
• Rotavirus vaccine (Rotarix) (Anon n.d.-g; Canada 2007a).

For these vaccines, the viruses are cultivated on Vero cells. This cell line was established in the 1960s using a few cells derived from the kidney cells of an African green monkey. The measles and mumps components of MMR vaccines (MMRVaxPro and Priorix) are cultivated on a culture that initially starts with cells obtained from chicken embryos. Similar to human cell lines, the original cells have long since depleted. Vaccines cultivated on animal cell lines do not pose a risk of transmitting animal diseases (Anon., n.d.-g).

3. Istihalah (Transformation)

Since the primary focus of the discussion is the role of transformation and consumption (istihalah and istihlak) in analyzing vaccines with haram origins, and gelatin derived from pig skin, bones, joints, and other parts is used in the vaccine manufacturing process, there is benefit in discussing the concept of transformation (istihalah) here.

3.1. The Lexical and Technical Meaningsof Istihalah

The term 'Istihalah,' in its literal sense, refers to the transformation of an object from one state to another. In the context of Islamic jurisprudence (fiqh), it is used to describe the process by which a substance that is considered impure (najis) becomes pure (tahir) after undergoing a change. The transformation of a substance's structure and qualities leading to its conversion into another substance is a phenomenon commonly observed in nature. In the literature of fiqh, istihalah is included among the methods for purifying impure substances (Okur, 2020).

3.2. The Nature of Istihalah

The mixing and transformation of prohibited substances in Islam, such as wine and pork, with other substances have been among the initial subjects of intense debate. There is a general consensus that if wine naturally turns into vinegar without any additives due to factors like aging, it is considered pure. However, when vinegar is produced by externally adding a substance to wine, the Hanafi school of thought and some followers of the Maliki school argue that the resulting product is deemed religiously pure and permissible (halal) (Okur, 2020).

According to the Hanafi school the concept of Istihalah holds a broader significance compared to other schools. According toAbu Yusuf, even substances considered im-pure (najis) should still be deemed impure based on their origin, even if they undergo transformation. However, Abu Hanifa and Muhammad argue that these substances can acquire a clean nature through Istihalah. In daily life, common difficult situations (umūm al-balwa) have been accepted as valid excuses, and considering the principle of facilitation, the second opinion has been preferred, forming the basis for legal rulings (fatwas). In addition to the Hanafis, the Maliki, Ja'fari, Zaidi schools, as well as scholars such as Ibn Hazm, Ibn Taymiyyah, and Ibn Qayyim al-Jawziyya, accept the transformative function of istihalah in purifying impure substances. However, the Shafi'i school and generally the Hanbali school do not accept this function (Okur, 2020).

Those who advocate for the positive outcomes of istihalah adopt the principle that the impurity of a substance is tied to its structural state. The transformation occurring in the substance's structure alters its impure nature. In this context, examples frequently cited in classical fiqh sources include the transformation of wine into vinegar, manure turning into ashes through burning, a pig or donkey being thrown or falling into a salt

lake and completely dissolving into salt, and olive oil contaminated with an impure substance turning into soap. As a result of such transformations, the resulting substances acquire a different nature and become religiously pure. Particularly in the discussions of Hanafi scholars on istihalah, two different types of changes can be observed. In these examples, it is accepted that when a structural change occurs, impure substances become pure. However, when milk turns into cheese, wheat into flour and flour into bread, grape juice into molasses, and sesame is ground into tahini, it is not regarded as a chemical change but a physical change occurs. Indeed, a qualitative transformation of a substance that is considered impure in religious terms does not render it into pure state. These explanations are closely linked to the knowledge accumulated during that era, and some contemporary scholars suggest that the examples given by jurists in terms of structural and qualitative changes should be examined and evaluated by experts in the field of chemistry to reach at a sound conclusion. Based on the data provided by the science of chemistry, derived from these examples, a distinction should be made between structural and qualitative transformations, and this differentiation should be based on scientific principles. Only through this approach can the conditions and religious rulings regarding istihalah be understood more clearly (Okur, 2020).

Scholars unanimously agree that naturally occurred transformation affects the determination of the legal status of a substance. However, there is disagreement among them regarding the impact of transformation on the istihalah legal status if it occurs as a result of intentional human behavior. This concept is rooted in the example of khamar (wine), which can be intentionally changed into vinegar through human intervention. The differences arise based on whether the wine was mixed with same materials until it converted into vinegar or if it was relocated from a shady spot to an area exposed to sunlight, or if the khamar container was left open for fermentation to occur, resulting in the transformation of the wine into vinegar (Al-Khatib, 2003:233).

• The first opinion: Intentionally performing the transformation process and intervening to bring about a specific alteration in substances is prohibited and does not convert the legal status. This opinion is supported by Umar bin al-Khattab, 'Uthman ibn al-'As, the popular Maliki's opinion, Shafi'i, and the well-known opinion in the Hanbali school of thought, which are the opinions of Ibn Taymiyyah and Ibn al-Qayyim (Al-Dusuqi 1996; Al-Ghananim, 2008; Al-Khatib, 2003; Al-Nawawi, 1995; Al-Qurtubi, 1993; Ibnu Qayyim, A. J., 2002).

• The second opinion: Intentionally performing the transformation process and intervening to bring about a specific alteration in substances is allowed and changes the legal status. This opinion is supported by Abu al-Darda, al-Thauri, al-Auzai, al-Layth bin Sa'ad, the Hanafi school of thought, the view of Imam Malik, one view of Imam Ahmad, the view of al-Bukhari, Ibn Hajar, and al-Qurtubi. According to this view, the act of intentionally changing wine into vinegar through intervention is justified, and the resulting vinegar is considered halal for use (Al-Ghananim, 2008; Al-Khatib, 2003; Al-Qurtubi, 1993).

• The third opinion: Intentionally performing the transformation process and intervening to bring about a specific alteration in substances is considered makruh (disliked but not forbidden), but it changes the legal status. This opinion is held by the Maliki school of thought and is one of the various opinions attributed to Imam Ahmad (Al-Dusuqi, 1996; Al-Khatib, 2003).

The focus in classical doctrine has been on specific examples and individual solutions. However, this has led to different interpretations and discussions among contemporary jurists regarding new developments and examples of transformation. These debates have created uncertainty regarding which groups to include and which principles and criteria to apply (Okur, 2020).

Some contemporary authors have associated istihalah with chemical reactions, expressing it as the transformation of a compound through the separation or addition of substances. The examples given in classical sources regarding qualitative changes clearly indicate that any chemical reaction is not considered an acceptable form of istihalah from a religious perspective. On the other hand, some scholars have stated that avalid istihalah would occur through the decomposition of a molecule into its elements or chemical constituents, and that the resulting product should be qualitatively different from the raw material after this decomposition process. Alongside chemical transformations that meet these criteria, it has been suggested that physical changes such as evaporation could also be considered valid forms of istihalah. In this approach, emphasis is placed on changes in properties (Çeker 2011:18–21). Furthermore, some scholars require that for a valid istihalah, the resulting substance must have undergone such a significant change that its source cannot be determined (Çayıroğlu, 2013).

3.3. The Transformation of Gelatin

Discussions on the permissibility/prohibition and cleanliness/impurity of vaccinesand medications arise due to concerns aboutthe presence of impure substances such aspork products, alcohol, and blood. Porkproducts are commonly used, particularlydue to their affordability. The istihalah process of substances with pork-based sources, such as gelatin, is a subject of debate. It is important to determine whether the impure substances used in gelatin production undergo transformation or not.

Regarding gelatin sourced from haram (forbidden) substances, there are two opinions: one permits the use of gelatin, and the other considers it is impermissible.

3.3.1. Opinions permitting the use of gelatin from haram sources

According to Nezîh Hammâd, pharmacists and biochemists argue that raw materials derived from animals, such as gelatin, undergo transformation. They claim that the impure and forbidden substances, such as skin and bones, have changed in essence and transformed into a different substance with a new name. Additionally, he suggests that the chemical transformation occurring in these impure raw materials is similar to the transformation of wine into vinegar (Nezîh, 2004). There is a consensus among juriststhat gelatin obtained from animals slaughtered in accordance with Islamic methods is considered pure. This means that if gelatin is derived from animals that have been ritually slaughtered (halal), it is deemed permissible and clean according to Islamic legal rulings. However, the ruling on gelatin obtained after processing from impure animals like pork can be approached based on whether the transformation in its raw material constitutes a valid religiously recognized istihalah. If the transformation is accepted as a valid istihalah from a religious perspective, the ruling on gelatin can be determined according to the views of classical jurists who considered transformed impure substances as pure (Aslan, 2016)

Nezîh Hammâd argues that the transformation of gelatin through a valid istihalah process renders it pure and permissible, even if it is derived from impure sources such as pig or dead animals. According to Hammâd,

the impurities associated with the original substances, including their characteristics, attributes, and names, cease to exist in gelatin production. Therefore, he asserts that the factors that rendered those substances impure are no longer present. Hammâd contends that gelatin undergoes a fundamental change in its structure, attributes, and name, becoming a new substance distinct from its original source. Consequently, based on the principle that "the default state of things is permissibility and purity," gelatin is considered permissible and pure. Hammâd maintains that through structural and chemical transformations, gelatin is purified from its impurities, attaining permissibility and purification (Aslan, 2016; Nezîh, 2004). According to Hirâvî, when impure/haram substances are transformed into a clean state through chemical processes and industrial interventions, they can be used if they pose no health risks. He argues that rulings are contingent upon names, and when names are altered, the associated rulings also change. For example, animal excrement that turns into ash through burning is no longer considered excrement. Therefore, the ruling applicable to excrement does not apply to ash because it has become a different substance with a distinct ruling.

Hirâvî argues that the change in names and attributes resulting from the chemical transformation of impure substances affects their rulings and allows them to be subject to a clean ruling (Anon., ts:7). According to the resolutions of the Medical Jurisprudence Conference held in Kuwait in May 1995 the process of transforming a substance, referred to as istihalah, changes impure and contaminated substances into pure ones and transforms forbidden substances into permissible ones according to Islamic law. Therefore, gelatin derived from the bones and skins of impure animals is considered pure and permissible for consumption (Nezîh, 2004).

Some Islamic jurists, such as Karadâğî, Takî el-Osmânî, and Ali Yusuf, state that if the production of gelatin from pig parts involves a valid istihalah process that results in a change of substance, then the impurity and haram rulings associated with the original substance no longer apply (Aslan 2016; El-Osmânî 2011).

3.3.2. Opinions prohibiting the use of gelatin from haram sources

Some contemporary scholars, particularly regarding gelatin, do not have a positive view towards subjecting pig-derived products to the process of istihalah (transformation). They argue that there is no complete transformation during the production process of gelatin and liken the conversion of collagen into gelatin to the process of boiling liquid eggs to solidify them into boiled eggs. According to this view, the only change occurs in the hydrogen bonds of the alpha helical structure. However, this procedure does not transform the egg into a different substance. Therefore, the conversion of collagen into gelatin results in differences in physical properties. Consequently, if the source animal of gelatin is not halal, then the gelatin itself is also not considered halal (Çayıroğlu, 2013; Çeker, 2011; Okur, 2020). The Presidency of Religious Affairs in Turkey, through the fatwa with reference number 69942030-105, has thoroughly examined the issue of using gel-atin derived from haram sources and, based on the reasons mentioned above, explicitly stated that it is not permissible. The fatwa highlights various aspects and considerations, ultimately concluding that the use of such gelatin is not allowed in accordance with Islamic principles and jurisprudence (Diyanet İşler Başkanlığı, 2016). Similarly, Vehbe Zuhaylî agrees that the use of pig

bones in gelatin production is not permissible, without mentioning the concept of istihalah endorsed by jurists (Vehbe, 1997). Indeed, among contemporary Islamic jurists, there are differences of opinion regardingthe extent of transformation that occurs in products derived from pigs and whether the prohibition on these products continues to apply. These differences stem from the distinction made by classical jurists between structural and qualitative changes. In order to consider a transformation, it is believed that the qualities of the original substance must undergo a complete change. This is because a perfect structural transformation is sought in istihalah, which purifies an impure substance. Therefore, some contemporary Islamic jurists accept examples such as the transformation of wine into vinegar as positive instances of istihalah, while not applying the rules of istihalah favorably to products of pig origin. The reason for this is that the main substance of wine, which is grape juice, is actually considered halal, but it becomes haram when it acquires intoxicating properties. When it transforms into vinegar, this property disappears, and it becomes halal again. Additionally, the idea that pig and pig-derived substances have "the same structural characteristics" and can be made usable through various chemical processes is not deemed appropriate when explained in the context of the concept of istihalah. Regardless of the debates and discussions regarding the controversies and adequacy of the opinions related to istihâla, this concept is generally based on the principles of public welfare (umûmü'l-belvâ) and facilitation, representing a middle ground solution. While these scholars acknowledge the purifying function of istihâla, they exclude pig-derived substances from this scope, categorizing them as "taabbodî rulings" that cannot be subject to expansive interpretation due to the absence of a known prohibition (Çeker, 2011; Okur, 2020).

3.4. The Analogies of Transformation

Scholars unanimously agree to accept transformation processes that are explicitly described in the Qur'an and Sunnah, such as the transformation of food excretion and blood into milk, blood of antelope into musk, wine into vinegar and the cleaning of the hide of a dead animal through tanning. However, there are differing opinions among scholars regarding whether all types of transformation are analogous to these four instances. This paper aims to clarify the subject of salt production involving the mixing of animal carcasses, specifically whether the collected salt is considered clean due to transformation or if it remains impure (mutanajjis) and forbidden (haram) for consumption. Scholars have presented two schools of thought to address this matter:

• The first school of thought holds the opinion that salt produced from a place mixed with feces remains impure and forbidden for consumption. This perspective is supported by Imam Malik, al-Shafi'i, Ahmad's final view, and Abu Yusuf (Al-Nawawi 1995; Al-Ramli n.d.:32; Ibnu al-Humam, n.d.; Ibnu Qudamah, n.d.).

• The second school of thought holds the view that the salt produced from the manufacture base that is mixed with impurities becomes clean due to the occurrence of istihadah and istihlak. This perspective is supported by Imam Abu Hanifah, Muhammad al-Shaybani, some Shafi'i scholars, and Hanbali scholars (Al-Nawawi, 1995; Ibnu 'Abidin, 1992; Ibnu al-Humam, n.d.; Ibnu Qudamah, n.d.).

• In conclusion, the final opinion in the Maliki, Shafi'i, Hanbali, and Abu Yusuf schools of thought does not consider istihalah to be analogous to substances other than the four

mentioned in the Qur'an and Sunnah. On the other hand, the final view in the Hanafi school of thought and the view of some scholars in the Maliki, Shafi'i, and Hanbali schools of thought allows for the analogization of istihalah. As long as the istihalah of substances occurs, and the ipmure substances are changed into other substances, the newly derived substance is considered clean.

4. İstihlak (Consumption)

Another important topic we should focus on is istihlâk, which refers to the purification or extraction of impure substances. Istihlâk plays a significant role in determining the rulings of certain substances, particularly those that contain small amounts of alcohol, such as vaccines. Therefore, it is necessaryto clarify the nature of this concept and examine its impact on the cleanliness of substances. In other words, it is crucial to determine whether an impure (najis) substance becomes clean as a result of istihlâk. Additionally, the perspectives of different schools of thought on this matter and the evidence upon which these perspectives are based will be examined.

4.1. The Lexical and Technical Meaningsof Istihlâk

The term “Istihlâk” has various meanings in its dictionary definition, such as spending, donating property, using up, disappearing, vanishing, consuming, and making efforts (Anon., 2004; İbn Manzur, n.d.). In the field of Islamic jurisprudence (fiqh), istihlâk refers to the process where a small quantity of impure (najis) or prohibited (ha- ram) substance mixes with a larger quantity of lawful (tâhir) and pure substance, and it dissipates within it, losing its odor, color, and taste characteristics (Nezîh, 2004). In other words, a substance loses its impure or prohibited qualities by dissolving and vanishing within a larger quantity of a pure substance, thereby becoming permissible for use. Istihlâk can be understood as a process of purification of substances (Mes‘î, 2014). Another important point to mention here is the relationship between istihlâk and istihalah. According to some Islamic jurists, istihlâk is considered a type of istihalah (Karadâğî and El-Muhammedî, 2011; Nezîh, 2004). In other words, a small quantity of a substance transforms into the dominant substance in terms of its structure and quantity. For example, when a small amount of blood is mixed with a large quan-tity of water, it dissolves in the water and is no longer referred to as blood. In this con- text, when two substances are mixed, the dominant one transforms the other. However, some Islamic jurists emphasize that these concepts are distinct from each other, and they examine the examples and rulings of each separately (Mes‘î, 2014). In istihalah, a substance undergoes a structural change and transforms into another substance. Istihlâk, on the other hand, refers to the situation where a small quantity of a substance disappears within the dominant substance. Here, it is a matter of invisible disappearance rather than transformation that can be observed (Cibiz, 2015; Mes‘î, 2014).

4.2. The Nature of Istihlâk

In this context, the issue of whether impure or forbidden substances become clean and permissible as a result of istihlâk will be examined. When an impure substance mixes with clean water, whether it undergoes istihlâk or not is subject to varying legal rulings in Islamic jurisprudence depending on the quantity and flow of the water. Therefore, it is necessary to establish a specific measure and criterion regarding how much water is considered sufficient or insufficient.

However, in contemporary discussions on the cleanliness of substances containing impurities, there is no mention of factors such as the flow or stillness of the water having an impact. There are differing views among the four schools of thought regarding the quantity of water.

According to the Hanafi school of thought, if the surface area of water is 10x10 zira (approximately 50 m2) or larger, and the depth of the water is such that a person cannot see the bottom of the water by cupping their hand, then this quantity of water is considered "abundant." Even if impurity (najasa) mixes with this amount of water and this amount of water does not change the taste, color, and odor, it is considered clean and can be used for religious purification rituals such as ablution (wudu). However, if the quantity of water is less than this amount, meaning it spreads over a smaller area, and impurity mixes with the water, the water is considered impure. In this case, it is sufficient for the impurity to mix with the water; there is no requirement to examine whether the taste, color, and odor of the water change (Merginani, 1990; Mevsili, n.d.; Zeyla'î, n.d.-a). On the other hand, according to the Shafi'i and Hanbali schools of thought, the quantity of water should be two kulleteyn (approximately 206 liters) or more (Bardakoğlu, 2003). If the quantity of water exceeds this limit and the impurity mixed with the water does not change its taste, color, and odor, the water is consideredclean. However, if there is a change in the water's characteristics, it is deemed impure (Gazzâlî 1997; Ibn Kudâme, 1997; Şirazi, 1996).

Mâlikî school of thought holds that the quantity of water is not significant; rather, the consideration is whether the impurity mixed with the water changes its taste, color, and odor. If the impurity that falls into the water does not alter any of its characteristics, the water is considered clean. In fact, some Mâlikî jurists state that even in the case of a small quantity of water, if the impurity does not change the water, it is still considered clean. However, they express that using this water is disliked (makruh) if there is other clean water available, and this is a well-known view in the school of thought (Hattab, 2003). As an example, Ibn Rushd indi- cates that certain jurists maintain the per- spective that as long as the impurity does notmodify any of the inherent attributes of the water, irrespective of its volume, the water isdeemed pure. This viewpoint is ascribed to Imam Malik. (Rüşd, 1997). However, according to Karâfî, Imam Mâlik's opinion is that if a drop of wine or urine, impure oil or impure food mixes with water, they are not considered impure, but if they are in big quantities, they are impure (Karâfî,1994).

4.3. Impact of Istihlak on Jurisprudence Rulings

According to the Hanafî school of thought, if a person drinks water that has been mixed with wine, and if the water completely masks and alters the taste, smell, and color of the wine, then the person is not subject to the prescribed punishment (hadd). This is because the water has rendered the wine largely ineffective (Serahsi n.d.-a:19) Similarly, if a woman's milk is mixed with medication and given to another child, if the quantity of medication is greater than the quantity of milk, then no milk kinship is established. This is because the medication has overcome and nullified the milk, rendering it void (Kâsânî, 2010; Zeyla'î, n.d.-b). In both cases, the dominant substance (water or medication) has significantly altered the properties and effects of the subordinate substance (wine or milk), leading to the nullification of their respective legal implications. In this case, there is no milk kinship formed

with rendered milk Similarly, if a lamb is fed with pig's milk, there is no objection to consuming its meat. This is because the pig's milk becomes ineffective without leaving any trace on the lamb. Likewise, there is no issue with consuming the meat of a sheep that has been given wine to drink. After drinking the wine, the wine becomes ineffective in the sheep's stomach, and it does not have any effect on its meat or milk (Serahsi, n.d.-b). If a person has taken an oath notto drink from the wine that is in their possession but later pours the wine into a container of water and if the water becomes dominant over the wine, causing the wine's color and smell to disappear, and the person drinks it, their oath is not considered broken (Kâsânî, 2010). This is because another sub- stance (water) has prevailed over the wine, rendering it ineffective. In this example, the dominance of water over the wine eliminates the impurity of the wine that has become ineffective within the dominant water (Şimşek and Köse, 2011).

According to the scholars of the Maliki school, such as Ibn al-Qasim, if milk is completely consumed within water, it is mentioned that this would eliminate the prohibition of milk's intimate relationship (mahremiyat). This explains the effect of istihlak on the relevant rulings (Karâfî, 1994; Kâsânî, 2010). In this school, it is not permissible to use wine for medicinal purposes. Some scholars within the Maliki school of thought acknowledge that there are two dif ferent opinions based on the experience that a medicine obtained by mixing it with an alcoholic beverage can yield positive results in treatment if the alcohol in the medicine is completely eliminated and its odor is removed. According to the Maliki school of thought, if milk mixed with water becomes completely ineffective within the water, it eliminates the prohibition of kinship (mahramiyet) associated with milk. However, using wine for medical treatment is generally not permissible in the Maliki school. Nonetheless, some scholars within the school allow the use of medicine that contains alcohol if the alcohol is completely eliminated and its odor is removed, and the medicine proves to be effective in treatment (Hattab, 2003).

According to the accepted correct view within the Shafi'i school, if impurity of different characteristics mixes with a quantity of water equal to or greater than two kull (approximately 384 liters), and this impurity does not alter any of the water's properties, then it is permissible to use the entire water. This is because in this case, the impurity has completely dissipated or become inconsequential within the water.

According to Shams al-Din al-Ramli from the Shafi'i school of thought, if a drop of urine mixes with a large quantity of water and this urine does not alter the properties of the water, then it is permissible to use the entire water. The rationale behind this is that the urine becomes completely nullified and thus rendered ineffective within the water (Remli, 1984). Indeed, it is well-known that applying pleasant fragrances to a personin a state of ihram (pilgrim sanctity) is prohibited, and those who violate this rule may face penalties. However, if a fragrant substance is mixed with medication or another substance in a way that causes it to lose its smell, taste, and color properties, rendering it completely ineffective, then its use and consumption would be permissible without incurring any penalties (Shirbînî, 1997). Zarkashi, a scholar of Islamic jurisprudence, has stated that if a drop of wine loses its intoxicating properties when mixed with a large amount of water, then the act of consuming it would imply that the wine in the water has become completely ineffective. As a result, the prescribed punishment of hadd

would not be applicable in such a case. However, it is important to distinguish between the prohibition of drinking the water containing wine and the exemption from the hadd punishment for the individual who drinks it. These are separate legal rulings with distinct implications (Zerkeşî,1982). In this context, although drinking such water does not warrant the hadd punishment, it is still considered impure (najis) and therefore forbidden to use and consume. According to this school, us- ing wine solely for medicinal purposes is prohibited. However, if wine is mixed with any other medication and becomes ineffec- tive in the process, it is permissible to use that medication for treatment when there is no clean alternative available (Dimyâtî, n.d.)

Hanbali school of thought emphasizes the impact of istihlak on legal rulings. For instance, if clean water used for ritual purification, such as in ablution or ritual bathing (gusl), mixes with another clean and purifying water without altering its taste, color, and odor, then the water remains is purifying. This is because the clean liquid or used water becomes ineffective or absorbed within the purifying water, rendering the previous rulings invalid. Additionally, if a person swears not to eat a certain food but then consumes it in a state where it has been absorbed or mixed with another food substance, the oath is not considered broken. (Buhûtî, 2009). The jurists have defined istihlak as the disappearance of the color, taste, and odor characteristics of a substance. Generally, the view of the jurists is that when a substance is absorbed and lost within another substance, becoming ineffective or neutralized, its ruling changes along with its identity. In other words, when a substance loses its distinctive features and becomes indistinguishable within another substance, its legal ruling is altered accordingly. In this context, we can say that when blood, wine, or similar substances drip into water, they are no longer present in the water, and the water has transformed it with its own characteristics it is mentioned that this impure substance dose not completely dissolve but they are seprarat into water in micro amount. Additionally, when a najis (impure) substance drips into or mixes with water in a quantity greater than the quantity of water, the najis substance has transformed the water according to its own characteristics. From these explanations, we can understand that the jurists believe that a small amount of najis substance mixed with water, the water cannot change chemically those najis substance but remains present within it.

4.4. The Use of Alcohol in Medications and Vaccines

Islamic jurists hold different views regarding the use of medications containing alcohol, according to the opinions of Abu Hanifa and Abu Yusuf, if medications contain alcohol in quantities that do not cause intoxication, they may be used for medical purposes. However, medications that contain wine made from grapes or dates are generally considered impermissible, although they may be allowed in cases of necessity (El-Osmânî, 2011).

Shafi school holds the view that using wine specifically for medical treatment is not permissible. However, the use of medications that have undergone istihlak (transformation) involving wine may be permissible. Some Shafi'i jurists, such as Shams al-Din al-Ramli, state that using medication containing transformed wine may be permissible in cases where there is no clean alternative available and when recommended by a trustworthy physician. (Remli, 1984) In this context, according to the Shafi'i school of thought, it may be permissible to use medications that contain alcohol for medical

treatment in contemporary times, considering the conditions mentioned above. It is important to note that individual circumstances and the advice of qualified scholars or medical professionals should be taken into account when making decisions regarding the permissibility of using such medications.

Hanbali and Maliki schools of thought hold the view that the use of medications containing alcohol is permissible only in cases of necessity. From another perspective, the evaluation of medications containing alcohol should be sought from chemists. If alcohol undergoes a chemical transformation in the medication and becomes another substance, then generally, it is permissible to use such medications based on the consensus of the Muslim community. For example, if wine has transformed into vinegar through a chemical process, its use would be considered permissible (El-Osmânî, 2011). Wahbah al- Zuhayli argues that the use of alcohol is permissible in situations such as wound treatment, instrument sterilization, and dissolving volatile substances. He bases his argument on the premise that alcohol is not spiritually impure and rejects its association with spiritual impurity (Vehbe 1997:29). Yasin b. Nasir asserts that the alcohol in medications is considered clean due to undergoing a chemical transformation (Hatîb, n.d.). In 1986, the Islamic Fiqh Assembly held in Jeddah concluded that medications containing a certain amount of alcohol can be used when there is no alternative non-alcoholic medication available and under the recommendation of a trustworthy expert doctor (Anon., n.d.-a). Mohammad al-Nadwi states that if the amount of alcohol inmedications is very minimal and there is noclean alternative available, it can be used (Nedvî, 2006). It is permissible to use vaccines containing small amount of alcohol, considering the negligible amount used (for example, in the Astra Zeneca Vaccine, approximately 0.002 g of alcohol/ethanol per dose of 0.5 mL). Taking into account the impact of transformation and consumption (istihlak) and the non-intoxicating nature of this minute quantity and based on the rulings of authoritative religious authorities and fatwas, the use of vaccines containing such small amounts of alcohol is deemed permissible.

5. The Application of Istihalah and Istihlak Jurisprudence in Vaccine Production

The production of vaccines is indeed a complex and costly process, which makes it challenging to fully ascertain the precise content of ingredients used during the manufacturing. However, certain references suggest the potential use of substances that are categorized as haram (forbidden) according to Islamic principles in the manufacturing of vaccines (Khoo et al., 2019).

The use of haram substances as ingredients in vaccines is a primary concern addressed by contemporary scholars. The focus lies in determining whether the processes of istihalah and istihlak have occurred, rendering the vaccine permissible (halal) for use. To provide further insight into this matter, this paper will conduct an analysis of the interrelation between vaccine ingredients, istihalah and istihlak, based on the discussed takyif fiqhi.

5.1. Vaccines are Haram and Only Permissible in Emergency Situations

The permissibility of vaccines is a subject of debate among current scholars, particularly in accordance with the Shafiia methodology. According to this perspective, if a vaccine is produced using a mixture of haram substances, it is considered haram. This stance aligns with the discussions held by the Malaysian National Fatwa Committee, which issued a fatwa addressing vac-

cines. The correlations between this opinion and the concepts of istihalah and istihlak are as follows:

• Istihalah and istihlak (transformation and consumption) do not occur in the vaccine production process because impure substances are mixed with pure substances. This cannot be compared to cases such as wine turning into vinegar and blood into milk as these instances do not involve the introduction of external haram substances. However, in vaccine production, forbidden substances from external sources are added to the pure substances.

• The inclusion of impure (haram) substances in vaccine manufacturing is a deliberate intention of the manufacturer. Therefore, even though there is a possibility of istihalah (transformation), it does not result in the transformation of the impure substance into a pure one.

• The visibility (Ain) of the unclean substance can still be recognized through laboratory experiments, and therefore the 'illah of proscription still exists since the visibility of the unclean substance persists. Consequently, the istihalah and istihlak that occur are incomplete and do not trans-form the haram nature of the added unclean substance. This is different from cases like wine turning into vinegar, where substances associated with the 'illah of haram (such as ethanol) are transformed into non-haram components (acid). In such cases, complete istihalah has taken place.

5.2. Vaccines are Halal

On the other hand, proponents of the Hanafiyah methodology believe that even if a vaccine is produced using a mixture of haram substances, once istihalah and istihlak have taken place, the vaccine is considered clean and halal for use without any emergency conditions. Institutions following this approach include the European Council of Fatwa and Research and the Islamic Organization for Medical Sciences, Kuwait. This opinion is based on the following concepts of istihlak and istihalah:

• When haram substances are added to the vaccine, but the vaccine has already undergone the process of istihalah, the legal status changes from haram to halal because the 'illah of forbidding ceases to exist. The final product is a vaccine with no remaining elements of unclean substances.

• The intentional mixing of haram substances by the vaccine manufacturer does not compromise the cleanliness of the final product, as istihalah has already occurred.

• While laboratory experiments may still identify the impure substances used in vaccine production, the materials have already undergone the process of transformation istihlak. The characteristics and properties of the impure substances are lost and dominated by the characteristics and properties of the pure substances.

6. Conclusion

In some vaccines, human and animal cell cultures are used in the initial propagation process. The human and animal cell cultures used for virus or antigen propagation are not the primary cells themselves; rather, they have undergone multiple divisions. As the second step of isolation and the third step of purification are performed during vaccine production, the effect of these cell cultures is no longer present in the final composition of the vaccines. Therefore, the use of these vaccines is considered permissible.

In some vaccines, porcine gelatin is used as a stabilizer, and it remains unchanged in its properties during the formulation stage

(stage four). It does not undergo transformation (istihalah) when added to the formulation.

However, there is a difference of opinion among scholars regarding the methodology of istihalah and istihlak, which depends on their adherence to a specific school of jurisprudence.

Scholars and juridical institutions following the Shafi'i school of thought are generally cautious in accepting the concepts of istihalah and istihlak. Consequently, they issue fatwas and legal explanations classifying end products containing unclean elements especially pig derivatives, as haram. This is because the 'illah (cause) of the unclean prohibition still exists, and no transformation (istihalah) or consumption (istihlak) has occurred.

On the other hand, Scholars and juridical institutions that follow the Hanafi methodology accept the process of istihalah and istihlak and they focus on the final product. If the final product is no longer considered unclean, they revert to the original ruling that the substance is permissible (halal) to use.

While scholars and juridical institutions adhering to the Hanafi school of thought accept the processes of istihalah and istihlak, some other scholars and juridical institutions, such as the Presidency of Religious Affairs of Turkey do not consider gelatin subject to the process of transformation (istihalah) due to the fact that it has not completely lost its original and primary properties in the correct and essential form. Also it is permissible to use vaccines containing small amunt of alcohol, considering the negligible amount used (for example, in the AstraZeneca Vaccine, approximately 0.002 g of alcohol/ethanol per dose of 0.5 mL). Taking into account, the impact of transformation and consumption (istihlak) and the non-intoxicating nature of this minute quantity and based on the rulings of authoritative religious authorities and fatwas, the use of vaccines containing such small amounts of alcohol is deemed permissible.

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