THE APPLICATION OF BIOTRANSFORMATION (*ISTIHALAH*) IN GENERIC PROCESS OF VACCINES MANUFACTURING FROM ISLAMIC LAW PERSPECTIVE

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Abstract

Breakthrough in fostering human health quality can be weighed good fortune or miracle to the history of humankind medication. However, pharmaceutical, which deemed as essential, often, considered almost inevitable from any ingredients that is considered as filth (al-najasat) in Islam such as porcine tissues, carcass, blood plasma, internal organs and alcohol. With the advancement of technologies, the manufacturing of medicines up to the point of enabling the removal of DNA of porcine that known in fiqhi device such as chemical transformation (istihalah). This paper that employs qualitative methodology identifying the point where does istihalah process occurs upon biologic drugs known as Vaccine. Several appropriate methodologies in Islamic law (usul fiqh) are used such as legal reasoning (ijtihad). This paper finds that the vaccines ingredient manufacturing engages with cell culture base that extracted from unlawful animal in the of Islam such as porcine or impermissible to consume like human, dog, monkey is inevitable from istihalah process before the process of manufacture of vaccine starts off.

Keywords: *Health, Quality, Vaccine, Istihalah, DNA*.

INTRODUCTION

Biotransformation *(Istihalah)* is an Arabic term denoted from the root word 'hawala' حاول that means change. From the shariah perspective, it relates to the irreversible conversion of a substance from an initially unlawful state to reach a lawful state physically or chemically. There is an emerging discourse of the application of *istihalah* in the field of pharmaceuticals especially concerning halal certification of biologics. This paper reviews the process of *istihalah* in biomanufacturing and considers the implications on the Islamic law of biologic drugs particularly on vaccine.

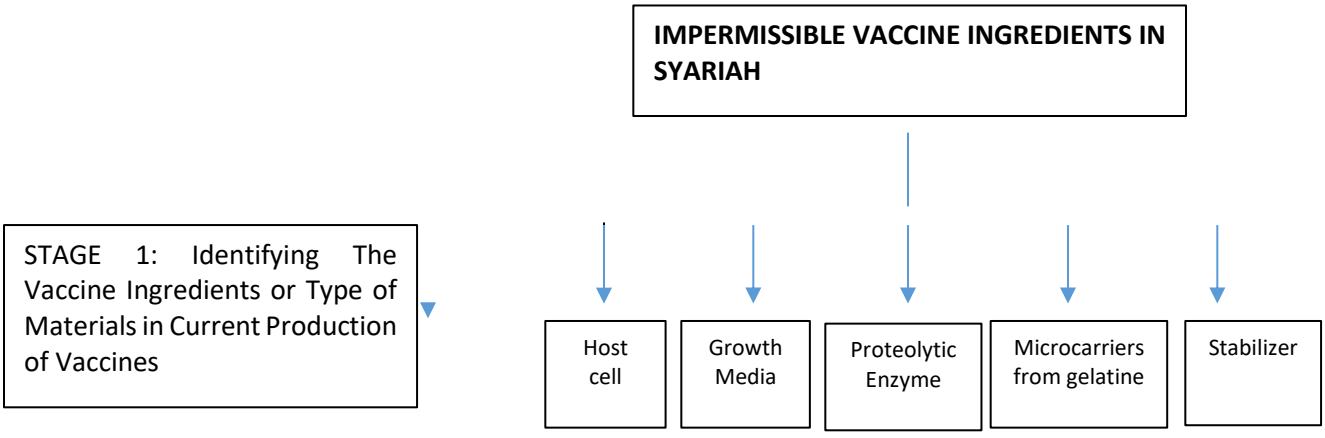
Istihalah is divided into two main opinions according to four prominent mazahib in fiqh. A group that viewed the status of *istihalah* as very strict point of view and another group that expanded its focus on the matter of *istihalah*, particularly when extracted from sources of

najasat. *Istihalah* is not regarded as determinant of legal rules in Malaysia religious affairs unless in few natural ambits only stemming from a concession in Shafi'ite sect (Zizi Azlinda, 2021).

Vaccination programs have successfully controlled diseases like polio, measles, and rubella, and recent developments include mRNA vaccines, which have proven effective in combating COVID-19. Malaysia implements the National Immunization Programme (NIP) which protects children against 13 major infectious diseases. More recently the National Covid-19 Immunization Programme (PICK) was implemented to provide widespread immunity during the pandemic. Many other vaccines are available in Malaysia including the HPV vaccine, pneumococcal vaccine, meningococcal vaccine and most recently the dengue vaccine, Qdenga, was approved by the Ministry of Health. Upon that resolution imposed by MKI in Malaysia, we totally comprehend that Islam never rejects the development of science and technology in manufacturing the biologic drug for prophylaxis from dangerous diseases, not to mention in new era of Industrial Revolution. However, this study will analyse the issue of which part of manufacture phase that pause vaccine from declared as *mubah* in the virtue of *darurah* and *istihalah*.

RESEARCH METHODOLOGY

This study employs Islamic jurisprudence (*Usul Fiqh*) methodology to vaccine manufacture phase from the Islamic perspective. Doubtless to state that, two primary sources; Quran and Prophet's sayings (hadith) are essential in creating Shariah ruling in any manners such as guidelines, rules or *fatwa* since Prophet (PBUH) and companions' time.



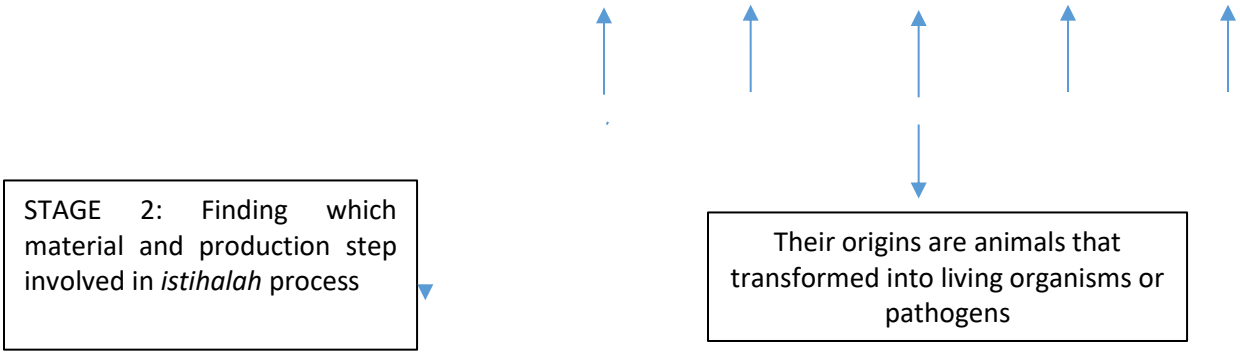


Figure 1.0: The analysis of the *istihalah* context in vaccine manufacture that has issue of impermessible ingredients in syariah

RESULTS AND DISCUSSION

Based on the analysis of the issue of impermissible animal derivatives either totally haram or grey area (*masyboh*) to be consumed in Islam, it fits under the process of *istihalah* that is impermissible to be consumed in Malaysia as Mazhab Syafie is the main fiqh school of thought that been applied for decades in this country.

Categories of vaccines

There are varieties of vaccines' categories. This categories are essential to be identified before employing the *ijtihad* of its ruling in order to ensure each vaccine manufactured through *istihalah* process or not. Once the *istihalah* process is determined in any category, then there are conformity that the reason why vaccine is deemed as *mubah* owing to *darurah* justification.

1. Live-attenuated vaccine. This vaccine contains live microorganisms that have been weakened or genetically modified to minimize their ability to cause disease while still effectively triggering an immune response when administered. (e.g. MMR (measles, mumps, and rubella);
2. An inactivated vaccine contains microorganisms that have been killed or inactivated through chemical, thermal, or other methods, while still retaining the ability to elicit an immune response. (e.g. hepatitis A and influenza);

3. Recombinant vaccine, which contains the component of the disease-causing microorganism such as protein molecules from bacteria cell wall and nucleic acid (e.g. hepatitis B);
4. A recombinant vaccine contains components of the disease-causing microorganism, such as protein molecules from the bacterial cell wall or nucleic acids. (e.g. diphtheria and tetanus);
5. A conjugate polysaccharide-protein vaccine combines polysaccharides with proteins to enhance the humoral immune response and promote immune memory in infants. (e.g. pneumococcal and Haemophilus influenzae type b).

There are four basic steps of vaccine production

According to MS2424: 2019, Manufacturing of vaccine will go through these four basic steps such as Propagation, isolation, purification and formulation (Department of Standard of Malaysia: MS2424: 2019).

Issues Evolving from Biotransformation (*Istihalah*) Technology to Vaccines' Impermissible Ingredients

Table 1.0: Impermissible materials used in current production of cell-based vaccines (N. N. Zulkarnain et al, 2021)

Types of materials	**Impermissible materials**
Host cell	(Madin-Darby Canine Kidney) MDCK cell line (From dog origin)
Growth media	Serum-containing or animal-component media
Proteolytic enzyme	Porcine trypsin
Microcarriers	Gelatin-coated microcarriers (FACT III, Cytodex 3, Cultispher S, Cultispher G)
Stabilizer	Porcine or non-slaughtered bovine gelatine

According to table 1.0, host cell, growth media, proteolytic enzyme, microcarriers and stabilizer contains material from animal origins as shown in the table. The acceptability and applicability of *istihalah* is variable according to the *mazhhabs* (Nurzaireena et al, 2018). The *shafi'ite mazhhab* is seen as more stringent and only accepts *istihalah sahihah* if the *istihalah* process has been strictly clearly proven dan described. Thus, in the *shafi'ite mazhhab, istihalah* is usually set aside and not used while *al-istishab* (continuity) is maintained on the non-halal status of cell culture techniques.

CONCLUSION

As a nutshell, istihalah process in the generic flow of vaccines' manufacturing occurs in propagation when it engages with cell culture, gelatine as microcarrier or stabilizer or animal base serum.

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