

**UNIVERSITI TEKNOLOGI MARA**

**OPTIMIZING IN-HOUSE DNA EXTRACTION SYSTEM  
FOR THE DETECTION OF *Sus scrofa* DNA TRACES  
IN PHARMA-COSMECEUTICAL PRODUCT**

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## ABSTRACT

The purpose of this study was to do an optimization of Reagent B in the newly produced in-house DNA extraction kit, for the purpose of reducing the unnecessary consumption of the reagent but still maintaining the efficiency in extracting an optimum purity and yield of DNA. Subsequently, this extraction kit was tested on several pharma-cosmeceutical products to ensure the existence of porcine DNA traces in the samples. This study was start on by extracting DNA from various samples using the in-house DNA extraction kit. Then, followed by conventional PCR to compare the DNA from samples with positive control. Consequently, running gel electrophoresis also being employed after the extraction process to visualize the size of DNA acquired and after the PCR to visualize the size of amplicons produced and to verify the specificity of the primer used. In conclusion, the optimum concentration of Reagent B to be employed in the in-house DNA extraction kit is 1mg/ml and the optimized in-house extraction kit plus the primer utilized in this study can become a promising tool in clarification of porcine DNA traces in Halal authentication.

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Muslims life is revolving around Halal and Haram concept. Halal means that anything that is permissible by the Islamic law (The Australian Federation of Islamic Councils Inc. (AFIC)) and anything that is forbidden by Islam that is said as Haram. One of the most forbidden items in Islam is pig (*Sus scrofa*). Therefore, consuming or using products that have traces of porcine is also considered as Haram.

Nowadays, there is an increasing awareness among Muslims about the Halal status of various consumer products, including food, pharmaceutical and cosmeceutical item available in the market. There are many issues pertaining to the Halal certification of a product. One of the issues is that many of such products in the market do not have Halal certification with the absence of Halal logo. Another issue that arises includes lacking standardization of Halal logos as the Halal certification can be issued by each state government. Because of this, consumers are hesitant and skeptical about the product's status as which one of the logos actually the real one and can be trusted. Some Muslim