UNIVERSITI TEKNOLOGI MARA

OPTIMIZATION OF IN HOUSE LYSIS REAGENT CONCENTRATION TOWARDS THE PERFORMANCE OF *Sus scrofa* DNA DETECTION SYSTEM

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ABSTRACT

The purpose of this study were to design an optimized DNA extraction method which can produce optimum DNA yield and purity and to link the optimized DNA extraction method and PCR reaction in order to develop a porcine DNA detection system that can be commercialized for *halal haram* authentication of pharma-cosmeceutical products. There are two testing parameters used in this study and comparison between these two testing parameters and standard parameter of in house DNA extraction method was made in terms of efficiency to extract genomic DNA. This study was begun with in house DNA extraction using the all parameters as well the standard, followed by running nucleic acid gel electrophoresis to determine the size of the extracted genomic DNA. Next, the efficiency of all parameters used was confirmed with PCR assays. PCR assays will amplify the target DNA sequence, therefore its sensitivity and specificity is very important. At the final step, nucleic acid gel electrophoresis was run to determine to size of the PCR products as well as to verify the efficiency of the two parameters. In conclusion, the two testing parameters used in this study have same efficiency as the standard parameter, and therefore can be used to replace the standard parameter. The results show that all pharma-cosmeceutical samples tested are free from porcine DNA. The efficiency of the optimized in house DNA extraction method is proven by the successive PCR assay.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Consumers nowadays are very particular and selective in what they buy, consume and used. The concept of *halal* is not limited to food only but is applicable in every aspect of man's life. The importance of this relevance cannot be overlooked. Rising area where *halal* products have made progress is pharma-cosmeceutical products. Since pharma-cosmeceutical products are manufactured mostly by non Muslim country, the status of these products is questionable and need to be verified. Although in the case of a life-threatening emergency, one is allowed to consume prohibited (*haram*) products, it does not absolve Muslims from their religious and ethical duties to seek for the lawful or *halal* products. This has lead to the increase demand of Muslim consumers to use and consumed only products that have been certified *halal*. *Sus scrofa* (porcine) is considered h*aram* in Islam. Therefore, any products that contain porcine sources are *haram.* Example of pharma-cosmeceutical products that contain porcine sources are capsules, gelatine, vaccine, insulin and heparin. Therefore, it is important to develop a reliable methods and procedures for porcine DNA detection system in pharma-cosmeceutical products.