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REPRODUCIBILITY COMPARATIVE RESEARCH OF DNA EXTRACTION METHOD PERFORMANCE TOWARDS ANIMAL BASED PHARMACEUTICAL AND FOOD PRODUCTS

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ABSTRACT

Muslims are very concern to the Halal and Haram status of the products. The authentication of Halal and Haram in products needs thorough examination and sometimes the existing detection technique of products containing *Sus scrofa* DNA traces are not accurate and time consuming. In order to make the product examination more sensitive, rapid and reproducible, the optimized extraction method has to be developed. The developed DNA extraction method enables the detection of *Sus scrofa* DNA traces in not only food products but pharmaceutical products as well. This research has been conducted to determine the best DNA extraction method that enables extraction of *Sus scrofa* DNA traces with optimum yield and optimum purity. A number of samples of raw meat (beef, chicken and pork), processed food (sausage from different brands) and pharmaceutical product (toothpaste from different brands) were analyzed. DNA was extracted by three methods: (1) In-house DNA extraction method, (2) Commercial DNA extraction kit (Wizard Genomic DNA Purification Kit) and (3) DNAzol extraction method. Comparative study between those DNA extraction methodologies was done emphasizing on the performance of extraction yield and purity. The polymerase chain reaction (PCR) was applied to identify *Sus scrofa* DNA sequence. By using primer XK5, cytochrome *b* sequence specific for *Sus scrofa* could be identified by PCR. Primer XK5 was used so that the products showed species-specific DNA fragment of 125 bp from *Sus scrofa*. Identification of PCR product is possible by electrophoresis.

CHAPTER 1

INTRODUCTION

Muslims are raised to eat clean, safe and Halal foods (Shaarani, 2002). However, most of the processed food products, pharmaceutical products and additives are imported from non-Muslim countries which create doubt for Muslim end-users. In industrialized nations, domestic pigs are raised in large-scale factory farms where the meat, called pork, can be mass-produced. The examples of popular food products made of pork include sausage, bacon, ham, pig knuckles, etc. Apart from that, additives such as stabilizers and emulsifiers which are essential in food processing and pharmaceutical products manufacturing were mostly derived from both plants and animals. The Halal status of additives from plant origins is rarely an issue but doubts arise when the additives derived from animals (Shaarani, 2002). The identification of species in food is becoming a very important issue concerning the assessment of food composition, which is necessary to provide consumers accurate information about the products they purchase (Rodríguez *et al.*, 2005).

Consumers demand higher protection from falsely labeled meat products for a variety of economic, religious and health reasons (Brodmann & Moor, 2003). Muslims in this country are very concern to the Halal and Haram status of the products and most of them will feel comfortable and definitely purchase any products bearing Halal certification than the other products without it. Products by a leading