

CHAPTER 1

INTRODUCTION

The main objective in the feeding of pigs is to produce piglets from breeding animals, and subsequently meat from those piglets, with the maximum efficacy and profitability. Since feed accounts for 70-80% of the cost of pork production, the correct formulation and rationing of feed is critical to this process. The availability of nutrients in feedstuff is often limited by the presence of anti-nutritional factors (ANFs), which may limit the use of these feedstuffs in animal diets. ANFs not only depress the digestive function and the animal performance but also cause a pollution by a nutrient excretion to waste. Due to differences in their structure and their biological effects, maximum destruction of ANFs may require different processing treatments. Heat processing has proved to be the most effective at reducing levels of trypsin inhibitors and lectin but should be carefully controlled. Insufficient heating leads to an incomplete inactivation of ANFs while overheating may reduce availability through the occurrence of Maillard reaction and denaturation. However, insufficiencies of some processing techniques have led to the search for new methods for the elimination of residual ANFs. Recently researches have been focused on the development of biotechnological approaches by means of supplement feed enzymes.

Utilization of microbial enzyme as a feed supplement has become one of potential means to increase animal productivity. However, enzymes commonly used have to be imported and no specific enzymes are yet being produced to enhance the nutritive value of feed ingredients commonly used in Thailand. Improved efficiency of feedstuff utilization, and the use of a wide range of feed ingredients currently considered inferior, are likely to produce the largest advances in animal feeding. Commercial application of feed enzymes is common and this technology promises to play an even more important role in the future by improving the efficiency of animal feeding and reducing pollution associated with manure. In order to improve the nutritive quality of feeds, the project was aimed to develop crude microbial protease by using common feed ingredients for use in monogastric animal with concerns on digestive physiology and stability to pelleting process.

Objectives

1. To select the effective *Bacillus* strain with highest protease production, resistance to low pH and stability to the pelleting process.
2. To maximize the protease production through optimization of media and cultivation conditions.
3. To select the most favorable carrier for enzyme drying.
4. To study some properties and cytotoxicity of crude protease powder
5. To investigate the influence of crude protease on the *in vitro* digestibility of nutrients of complete diets and the productive performance of piglets