

Chapter 1

Introduction

The interest in developing functional foods is thriving, driven largely by the market potential for foods capable of improving health and well-being of consumers. The concept of functional foods includes foods or food ingredients that exert a beneficial effect on host health and/or reduce risks of chronic diseases beyond basic nutritional composition. Recently, functional food research has moved progressively toward the development of dietary supplementation, hence, introducing the terms probiotics and prebiotics, which evidently affect gut microbial flora and activities (Charalampopoulos *et al.*, 2002).

Thailand is famous in cereal cultivation, particularly rice which is used not only for domestic consumption, but also for exporting to several countries around the world. The most famous Thai rice is jasmine rice which has unique aroma flavor. Among rice types, which include white, black or purple, red and brown rices, cultivating in Thailand, white rice gains the most growing area. The second popular rice type is black rice, which is known as native rice. This rice has gained more interest for its antioxidant activity containing anthocyanin (คำเนิน *et al.*, 2543). Besides consumed as a main meal dish, different rice types have been prepared to various rice products such as rice milk, candy and sweets (Anonymous, 2007e).

Within this decade, probiotics and prebiotics have been extensively produced in several brand names or product types. Many microorganisms especially lactic acid bacteria are applied into food products and are claimed that their activities can

enhance the health of consumers. Lactic acid bacteria are very common bacteria found in many Thai fermented foods. They produce lactic acid as an end product of the fermentative pathway, homo- or heterofermentation. At the same time many reports have shown that probiotic activity of lactic acid bacteria, including changing in gut microflora and lower pH which minimizing pathogenic bacteria to attach to gut epithelial cells, can help protecting the host from infection (Anonymous, 2005d, Chukeatirote, 2003 and Holzapfel *et al.*, 2001).

In this study, the utilization of rice products particularly black and brown rices was improved by producing rice milks with an addition of *Lactobacillus acidophilus*, a lactic acid bacterium that was documented to have probiotic properties. The success of the project would produce a higher economical value for rice products, support Thai farmers that produce black and brown rice by increasing their demand and increase a market share for a dietary commodity. In the long term, the project would also encourage more consumption and export activities of rice products, not only as a grain product but also as a value added product for Thai people and beyond.

The purposes of this project were

1. to investigate the effects of types and concentrations of rice milk on the viability of *L. acidophilus* during storage at chilled temperature
2. to evaluate the effects of initial rice milk pH, initial number of *L. acidophilus* and carbohydrate addition on the viability of *L. acidophilus* during storage at low temperature

3. to study a viability improvement of *L. acidophilus* during low storage temperature in rice milk using an immobilization technology



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