The Effect Of The Concentration Of Skimmed Milk And Sucrose On The Quality Of Probiotic Beverage Made From Pineapple Skin Extract Fermented By Enterococcus sp. Of Tempoyak

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Introduction
Tempoyak is a traditional fermented food made of durian fruit in Indonesia. Enterococcus sp was isolated from tempoyak. The objective of these researches were to study Enterococcus sp ability (UP-9, UP-11, and UP-14) in taurocholate acid conjugation and cholesterol binding and the effect of addition of skim milk (SM) and sucrose (Sc) concentration as a source of nutrition for the bacteria to produce probiotic beverage. The beverage was made from pineapple skin extract that had essential nutrition (but contain relatively low) for bacteria growth.

Method
Exp1. This research carried out experimentally and the observations were made on LAB in capabilities to bind cholesterol and to deconjugate taurocholic acid with three replications. The best results from Exp1 would be used in making probiotic beverage. Exp. 2. A complete random design with a 4 x 4 factorial arrangement with three replications was used. The first factor was concentrations of SM (0%, 5%, 10%, 15% w/v) and the second factor was concentrations of Sc (0%, 4%, 8%, 12%). Variables observed in Exp.1 were the ability of bacteria to deconjugate of sodium taurocholic and to bind cholesterol, and in Exp.2 were pH, total density, protein level and total Lactic Acid Bacteria (LAB). Sensory evaluation (color, aroma, taste, and overall acceptance) of was analyzed by Friedman test.

Result
The results showed that Enterococcus sp UP-11 had the ability to bind cholesterol, but the strain of UP-9 and UP-14 had not. In addition, Enterococcus sp UP-11 can grow and deconjugate sodium taurocholic effectivelly. Increasing the concentration of SM and Sc in medium significantly increased ($P<0.05$) pH and total density. The interaction of Sm and Sc were not significantly different ($P>0.05$) on pH and total LAB, but these interactions were significantly differences ($P<0.05$) on protein and the total density level.

Discussion
The variety responses of LAB in deconjugation of bile salts into free bile acids were probably due to differences in the ability of LAB to produce enzymes Bile Salt Hidrolase and also a genetic trait from each LAB. When compared to the three LAB strains, Enterococcus sp. UP-11 had the ability to bind cholesterol, whereas the Enterococcus sp. UP-9 and Enterococcus sp. UP-14 were not able to bind cholesterol, although this LAB could grow on MRS-Thio Broth. The addition of SM and Sc affected the pH, protein content, total LAB, and total density. It was because of the SM pH already exceeded neutral pH (pH 8.69), so the more SM added would increase the pH and the addition of SM was aimed to increase the protein level, and total density. Bacterial population in all treatments ranged between 11,40-11,80 log cfu/ml. The bacterial population still exceeded the standard minimum number of probiotic bacteria in the probiotic beverage. The addition of SM (15%, 10% and 5%,w/v) and Sc 12% to probiotic beverage could be received by panelist based on acceptance of the assessment color, aroma and taste and overall acceptance of it.

Keywords: cholesterol, taurocholic, skim milk, sucrose

Vacuum Drying for the Production of High Stability Dried Probiotics

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Introduction
High viability of probiotics during drying and storage is of importance due to their increasing use in dried concentrated forms for the direct inoculation to fermented foods (Direct-Vat-Inoculation, DVI) and the development of dried probiotic preparation. The concentrated cultures should have high enough viability (1011-12 cells/g) to resume fermentation immediately after the inoculation. Likewise, the health benefits of dried preparations are commonly dose-dependent (e.g. daily dose of 109 cfu). These dried forms are conventionally produced by freeze drying, which is a lengthy and expensive process. Therefore, alternative drying techniques with comparable performance are sought.

Methods
In our studies, the vacuum drying of Lactobacillus helveticus and L. paracasei ssp. paracasei was investigated. MRS plate counts, formazan dye, and fluorescent dyes and atomic force microscopy (AFM) were used to examine viability, metabolic activity, and cell membrane integrity. Changes in membrane phase behaviour were examined by FT-IR spectroscopy.

Results
We found that viability, metabolic activity, and integrity of cells decreased during the vacuum drying. Viability was reduced with drying time, and the greatest drop was found when the cell water content decreased from about 0.5 to 0.3 g H2O/g dry weight. Accordingly, at the critical moisture content, AFM images showed cracks on the surface of dried [illegible] observed in frequencies that are attributed to cell membrane. The