4236174 NUFN/M : MAJOR : FOOD AND NUTRITION FOR DEVELOPMENT ; M.Sc. (FOOD AND NUTRITION FOR DEVELOPMENT)
KEY WORDS : DIETARY FIBER / SUGARCANE BAGASSE / CAKE

PAWITA SEEKEOW : FORMULATION OF DIETARY FIBER-ENRICHED CAKE USING SUGARCANE BAGASSE. THESIS ADVISORS : ANADI NITITHAMYONG, Ph.D., SOMKIAT KOSULWAT, Ph.D. 109 p. ISBN 974-04-0971-7

At present, most people have inadequate dietary fiber (DF) intake due to changes in eating habits which have been found to cause many diseases such as gastrointestinal disorders, colon cancer, coronary heart disease, obesity, and diabetes. Sugarcane bagasse (SB), a high DF content by-product from the sugar and juice industry, could be considered as a potential DF ingredient. Hence, this study aimed to utilize ground sugarcane bagasse (GSB) as a source of DF by incorporating it directly into bakery products which are common food items. The developed product of an acceptable quality can be a choice for consumers who are health-conscious.

GSB was prepared by washing, drying, and milling the fresh SB. Then, the physical properties and chemical composition including total, insoluble and soluble dietary fibers were determined. The water holding capacity was 4.37 g/g sample. GSB consisted mainly of DF (81.2% wet basis) with the major fraction being insoluble (79.5% wet basis). When GSB was used as a substitute for wheat flour in preparing cookies and cake, it was found that the maximum level which could be substituted was 5% and 20%, respectively. Thus, cookies were not further developed since their increase in DF content was too low. The overall acceptability score on a 9-point hedonic scale of DF-enriched cake was around "like slightly". To improve the quality of DF-enriched cake, formula and process adjustment i.e. effect of mixing technique, effect of emulsifier type, and effect of amount of baking powder were studied. No significant differences were found in the volume of any of the formulas. Results of texture measurement showed that DF-enriched cake with SP® as an emulsifier gave a similar texture value to the control formula, whereas premixing GSB with fat used in the formula and an increase in the amount of baking powder yielded a higher and lower texture value, respectively, compared to the control formula. Although no significant differences were found in the overall acceptability score for any of the DF-enriched formulas, the DF-enriched cake with 6% baking powder received the highest score (6.70±1.62). Thus, this formula was further evaluated in an in-house consumer test compared with the control formula. The overall acceptability score of the product (6.04+1.40) was "like slightly", and the scores for general appearance, color, shape, and flavor were between "like slightly" (6.00) and "like moderately" (7.00) However, the texture score (5.56+1.78) was between "neither like nor dislike" (5.00) and "like slightly" (6.00). The major difference between DF-enriched cake and control was the grittier texture.

From chemical analysis, the DF-enriched cake provided 10% of the Thai RDI for DF or 2.5 g per reference amount, and could be a good source of fiber. The DF content of the product was increased by 3.8 times accompanied by a slight decrease in energy content (4%) when compared with the control formula. The cost of the ingredients of the DF-enriched cake was higher than that of the control formula.