

Development of Banana Pseudo-Stem Incorporated Chips and Study the Acceptability of the Product

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The banana pseudo-stem is an underutilized by-product of banana cultivation and is available throughout the year in Sri Lanka. It is rich in dietary fiber with many health benefits. The study was aimed to develop a banana pseudo-stem incorporated chip and evaluate its proximate composition and shelf-life. Initially fresh banana pseudo-stem was chopped, boiled and ground to fine paste. The dough was formulated by partially replacing wheat flour with boiled paste (wheat flour: pseudo-stem paste, 80:20, 70:30, 60:40, and 50:50), where the dough without the banana pseudo-stem paste was considered as a control (100:0). The cut dough was fried (180 °C, 10-15 minutes) using coconut oil to prepare chips. Based on the sensory evaluation results, 70:30 wheat flour to banana pseudo-stem was selected as the best formulation. Then the proximate analysis was carried out for ground raw and boiled banana pseudo-stem samples. According to the results, raw pseudo-stem was exhibited the highest proximate composition than boiled stem. For the best formulated chips and control, the proximate composition of ash ($2.43\pm 0.01\%$), crude fiber ($3.08\pm 0.10\%$), and crude fat ($26.42\pm 0.33\%$) contents were significantly higher ($p < 0.05$) in the best-formulated chip compared to the control. There was no significant difference in control and best-formulated chip for moisture, crude protein, and total reducing sugar. Shelf-life analysis such as visual observations, moisture content, and total plate count for both chips was carried out in two weeks for three packing methods (normal, vacuum, and nitrogen gas) using polythene as packaging material at room temperature (25 °C). The results of this study show that they can be stored for up to two weeks without any remarkable changes in the organoleptic and microbial qualities with the evidence of no bacterial and fungal colonies in both control and best-formulated chip during 1st and 2nd weeks of storage. However, a prolonged study is needed to ensure the shelf life of the produced chip. Among the packing methods studied, nitrogen packing was found to be the best packing method compared to others. Overall, the banana pseudo-stem could be a potential source to replace the wheat flour in making healthier chips with good keeping and eating qualities.

Keywords: Banana pseudo-stem, Chips, Proximate composition, Nitrogen packing