EVALUATION OF THE QUALITY CHARACTERISTICS OF NUTRITIONALLY ENRICHED BISCUITS PREPARED FROM WHEAT - DEFATTED COCONUT FLOUR

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ABSTRACT

Biscuits made with wheat flour are an important diet for many Sri Lankan. However, refined wheat flour is not a good source of dietary fiber and protein. Therefore, partial substitution of wheat flour by other locally available raw material such as defatted coconut flour can be used in order to improve the nutritional quality of biscuits. Coconut scrapings from good quality coconuts were obtained, defatted, sun-dried, milled, sieved and packed in air tight container and stored under refrigerated condition until further use.

The defatted coconut flour was nutritionally analyzed that it contains 4.2% protein, 13.0% fiber, 9.2% fat and although 39.1% soluble carbohydrate, so a successful combination with wheat flour for biscuit production would be nutritionally advantaged. In this study, the possibility of using coconut flour for the production of biscuits was investigated. Wheat flour was substituted with defatted coconut flour in varying proportions of 0, 10, 20, 30, 40 and 50% (w/w) to make composite flour blends for biscuit. Prepared biscuits were subjected to physical, chemical, microbial and sensory attributes to evaluate the suitability of biscuits for consumption.

The physical parameters of wheat – defatted coconut flour biscuits such as thickness, volume, density and spread ratio showed a decreasing trend with the marginal increasing level of defatted coconut flour while diameter showed the increasing trend. The results showed that protein, fiber and fat increased significantly ($p < 0.05$) with the increase in substitution of defatted coconut flour. Protein, fiber and fat value of defatted coconut flour fortified biscuits increased with progressive increase in proportion of defatted coconut flour and 40% coconut flour added biscuits obtained values of 10.7%, 11.3% and 22.7% respectively.

The textural evaluation of the biscuits revealed that, defatted coconut flour incorporated biscuits were comparatively softer than that of control biscuits made from 100% wheat flour. Control biscuits have the highest mean score for hardness (10.9 N) while the 50% defatted coconut flour incorporated biscuits gained the lowest mean value (6.22 N). From the sensory analysis, 40% coconut flour incorporated biscuits obtained the highest preference compared to other tested combinations. This study revealed that up to 40% substitution of wheat flour by defatted coconut flour is possible to produce biscuit with acceptable qualities.

Based on the quality characters, the most preferred wheat – defatted coconut flour biscuits were selected and subjected to storage studies. Quality assessment during storage was carried out in two weeks interval through the experimental period. The findings of the study revealed that, the declining trend was observed in protein, fat, fiber, ash and total sugars with storage period and an increasing trend was observed in moisture with storage period for all the treatments.

From the above research study, the 40% defatted coconut flour added biscuit has the highest scoring in all aspects compared to other combinations. There were no remarkable changes observed in the organoleptic characters of biscuits packed in laminate of aluminum upto 3 months of storage in ambient conditions of average temperature 30°C and the RH of 75 – 80% indicating that the 40% defatted coconut flour added biscuits could be stored for 3 months without any significant changes in quality.

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