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Impact of extrusion cooking on nutrient composition of a composite flour mixture developed using local grain varieties

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Extrusion cooking is preferred over conventional cooking in the food industry because it yields high production and retains significant nutrient values in a minimum processing time. This study presents the impact of extrusion cooking on nutrient components of composite flour mixtures developed using locally available grain varieties in Sri Lanka. Formulations were developed fitting to two factor factorial design using kalu heenati (WF 13272) rice flour as the major ingredient. Further, green gram flour, black gram flour, meneri flour were composited with black seeds, sesame seeds and cinnamon in developing the final product. The flour formulations were mixed with water to produce dough of suitable consistency. These dough mixtures were extruded at 95-100 ^{0}C using a single screw extruder for a specific time. The proximate composition of samples before and after the extrusion process including carbohydrate, crude protein, crude fat, dietary fiber and ash were analyzed according to the AOAC official methods of analysis. The results showed that the extruded samples had 0.72-5.56% carbohydrates, 0.25-0.89% protein, 0.01-0.04% ash, 0.03-0.14% dietary fiber more than that of samples prior to extrusion process. Further, the extruded samples had 0.19-0.36% crude fat less than that of sample prior to extrusion process. The highest percent difference during extrusion cooking is of carbohydrate content and the lowest percent difference is of ash content. In conclusion, extrusion technology is identified as a beneficial technique in improving the nutritional composition of food products. The potential to increase nutrient availability highlights the significant impact of extrusion on the nutritional quality of foods. As this technology is of increasing concern in the food industry, further research is suggested to optimize the extrusion process and develop nutrients rich food items that meet consumer expectations for taste and sensory appeal as well.

Keywords: Extrusion technology, Nutrient components, Composite flour mixtures, Grains