# Comparative study on the physicochemical properties of extruded fortified rice kernels produced from different rice varieties with their corresponding rice varieties

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Broken rice are by-products of rice milling industries that could be refabricated to produce fortified rice kernels (FRK), a novel health product. FRK are manufactured by blending broken rice flour with vitamin-mineral premix and extruding it to rice-shaped kernels. These FRK are then mixed with raw rice in a specific ratio to produce micronutrient fortified rice, which reduces the cost of rice fortification. For this purpose, the FRK produced from a rice variety must match with the same rice variety. Therefore, the study was aimed to collect the broken rice of different varieties (raw and parboiled) and produce FRK thereof.

In this study four parboiled and three raw rice varieties were collected and processed to produce FRK. The FRK's apparent amylose content (AAC), color, density, functional properties, and cooking time were compared with that of the corresponding native rice variety.

The AAC of the native rice varieties was in the range of 20 to 24%. After extrusion, the AAC of the FRK (18.02 to 22.79%.) decreased. The lightness, redness, and yellowness values of the FRK varied between 68 to 77, 0.9 to 3, and 16.02 to 19.06, respectively. The total color change ($\Delta E$) of FRK were < 3.6 for the raw rice, while were 7.19 - 10.29 for parboiled rice. The difference between the bulk density of all varieties of raw rice and FRK was < 9%. The WAI, WSI, and cooking time of the FRK were lower than that of the raw rice.

This study showed that there were significant differences between the properties of FRK of different rice varieties. Furthers studies on optimization of the processing conditions for rice varieties based on amylose: amylopectin ratio would help the production of FRK that matches the characteristics of native rice variety, thus facilitating sustainable production of low-cost novel health food.

**Key words:** Fortified rice kernels, By-product utilization, physicochemical properties, Extrusion, Fortification