

Different Parboiling Process Effect on the Formation of Resistance Starch in Raw Paddy Varieties

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The parboiling process leads improves rice quality and enhances the physio-chemical properties of grains. Parboiled rice exhibits several advantages over raw rice products, such as strengthening kernel integrity by forming resistant starch, increased milling recovery and preventing the loss of nutrients. Two Department recommended varieties with red pericarp (*At362*), white pericarp (*Bg366*) and one industrial type with red pericarp (Adakari) were used for investigation in this study. Paddy samples were prepared in different duration and methods of soaking and steaming with controls (Raw rice). Different parboiling practices were investigated on their milling yield qualities, refers as Head Rice Yield (HR) and resistance starch formation (RS) during cooking. Initially, raw paddy samples were soaked in cold water at the intervals of a day, 2 days, 3 days, 4 days, and 5 days with a volume ratio of 1:1.5 and the steaming procedure was practiced for 20 minutes duration as Soak Steam (SS), Pressurized Soak Steam (PSS), Un-soaked Steam (USS) in an electric rice cooker with steamer. The parboiled paddy was dried under a conventional oven at 60 °C temperature for 3 hrs., which achieved a suitable moisture level for safe milling. An extrusion test was performed to test the internal strength of the rice kernel after cooking. Cooking of Parboiled rice was performed with water in a volume ratio of 1:1.2, duration of 20 minutes in an electric rice cooker. The running temperature of the extruder was 30 °C, and the speed was 30 rpm. There was a rice kernel had high resistant starch content extrusion test yield outcome is low. The Highest head rice yield was counted in the Pressure-soaked steam (PSSP) method with 2 days of soaking duration (48 hrs). Pressure-soaked steam (PSS) samples show a lower extrusion outcome than other parboiling methods, yielding good resistant starch parboiled rice. All other parboiling methods gave moderate head rice yield and extrusion outcome. Raw rice samples show a higher extrusion outcome and lower resistant starch than parboiled rice samples.

Keywords: Extrusion test, Resistant starch, Head rice yield, Paddy soaking & steaming.