Title Water Adsorption Effect on Milling Quality of Thickness Fractionated Rough rice

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Citation 2005 ASAE Annual International Meeting, Tampa Convention Center, Tampa, Florida, 17-20 July 2005, Paper Number 056200, 2 p.

Keywords: Rice; thickness fraction; moisture content; head rice yield; moisture adsorption; fissure; rice kernels

Abstract

This study was conducted to quan6tify the effect of water adsorption on the milling quality of different thickness fractions of long-grain rice varieties Francis and Wells grown at two locations in Arkansas and Missouri. The objective was to simulate water absorption by rice kernels while maturing in the field and o measure effects on milling quality. Samples were plot combine-harvested at about 22% moisture content (MC), cleaned, and fractionated into thin (<1.88 mm), medium (1.89 to 2.02 mm), and thick (>2.03 mm) darnels. From each fraction, sub-samples were conditioned to 12, 14, 16, and 18% MC, which represented the initial MCs (IMC) of rough rice before soaking. Each sample was soaked in 20°C water for 2 hours using a water bath. Samples were drained and then dried in a conditioning chamber to about 12% MC, and then milled using a McGill no. 2 mill. Head rice was separated using a shaker table separator and head rice yield (HRY) calculated. HRY was significantly affected by kernel thickness fraction and the IMC of rough rice. Also, for both varieties, the thickest kernel fraction with the lowest initial MC sustained the greatest HRY reductions. As much as 38 percentage points HRY reduction was incurred for the thick kernel fraction of Wells at 12% IMC. High IMC kernels were least affected by soaking. For samples harvested at both locations, Wells had higher HRY reduction than Francis at all MC levels. In addition to measuring HRY, kernel fissures were enumerated as a factor affected by water absorption. Kernel fissures and initial kernel MC was inversely correlated to HRY. Thick kernels incurred more fissures than medium and thin kernels, respectively.