Anocha Suksomboon 2007: Effect of Dry- and Wet-Milling Processes on Rice Flour, Rice Starch and Rice Noodle Properties. Doctor of Philosophy (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Professor Onanong Naivikul, Ph.D. 162 pages.

This study was aimed to determine the effect of dry- and wet-milling processes on rice flour, rice starch and rice noodle properties. Dry- and wet-milled rice flours were prepared from Pathum Thani 1, RD 7 and Leuang 11 rice varieties. Rice starch was isolated by alkaline extraction method. Rice flour showed significantly higher protein, fat, and ash contents compared to those of rice starch. Dry-milled rice flour contained significantly (p<0.05) higher amounts of protein, fat and ash than those of wet-milled rice flour. In all rice varieties, the dry-milled rice flour gave the higher amount of starch damage (8.31-9.11%) than those of wet-milled rice flour (2.99-5.70%) as confirmed by scanning electron micrographs. The influence of milling process was affected to physicochemical properties particularly for rice flour. Dry-mill rice flour showed significantly (p<0.05) higher gelatinization temperatures (T_o, T_p and T_o) than those of wet-milled rice flour, whereas it presented lower ΔH compared to wet-milled samples. Pasting properties showed that dry-milled rice flour showed the lower peak viscosity and breakdown, the higher setback compared to wet-milled rice flour. Dry-milled rice flour and starch from all three rice varieties had the lower proportion of high-molecular-weight fraction (fraction I), but higher proportion of low-molecular-weight fraction (fraction II) compared to wet-milled samples. However, there was no significantly different (p≥0.05*)* of the molecular weight of both fraction I and fraction II between dry- and wet-milled samples. Rice noodle prepared from dry-milled rice flour showed significantly (p<0.05) higher water absorption index (218.19-277.19%) and cooking loss (4.91-7.02%), but lower cutting force (38.58-98.93 g) and tensile strength (10.82-30.29 g) compared to rice noodle prepared from wet-milled rice flour. Rice noodle properties were significantly (p<0.05) correlated to amount of amylose content, swelling power at 55°C and breakdown of rice flour.

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