

Effect of Duration of Soaking and Steaming on the Quality of Parboiled Paddy Practiced in Small Industries

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Parboiling is the hydrothermal treatment applied before milling in order to increase milling recovery by minimizing broken rice percentage. Parboiling process has three stages, namely soaking, steaming and drying. Soaking and steaming play a key role in determining quality of paddy grains by changing physical and chemical properties. Therefore, this study was aimed to determine the effect of duration of soaking and steaming on head rice yield in parboiling process. Paddy samples were subjected to different combinations of soaking and steaming durations while keeping the other conditions constant. Three sets of four paddy samples were subjected to soaking for 24, 48, 72 and 96 h and one set of each sample subjected for different time of soaking was subjected to steaming for 1, 2 and 3 h. Treatments were replicated three times. Lab scale de-husking, milling and polishing machines were used to evaluate the head rice yield and broken rice yield percentages. Lab scale white belly detectors were used to count whiteness value, which reflected the appearance of final processed product. The paddy sample subjected to 72 h of soaking with steaming for 3 h, yielded highest de-husked head rice recovery (85.3%) and less percentage of broken rice (14.7%). The sample subjected to 72 h of soaking with 3 h steaming showed less whiteness value of 10.4 than other treatments. The results revealed that, the good recovery and whiteness were obtained with increasing soaking and steaming durations at certain limit. The cost incurred for the boiler was Rs. 20100 per ton. The amount of paddy parboiled in a batch was recorded in the same way that was used to measure the biomass consumption. The amount of rice husk consumption in the parboiling process of a batch of paddy was calculated as 2530 kJ per ton. The local parboiling process can be improved in terms of the energy consumption and the market value of the rice by adopting the boiler process. Therefore, it is concluded that, parboiling process can be optimized by using the combination of 72 h of soaking with 3 h of steaming to improve the local parboiling process in terms of quality of parboiled rice and energy consumption.

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