

Optimization of traditional pre-milling treatment for pigeon pea dehulling

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ABSTRACT : Pigeon pea (*Cajanas cajan*) is one of the important pulse crops of India, contributing about 20% to the total production of all pulses. It accounts for 90% of the total world production of pigeon pea. Cleaned and graded lots of pigeon pea cv. P-992 were selected for the study. Two pre-milling methods were undertaken for the study namely; hydrothermal and heat treatment. Steam pressure and residence time for the hydrothermal treatment were taken as independent variables. Three levels of each, steam pressure (0.5, 1, 1.5 kg/cm²) and residence time (5, 10, 15 min) were taken for hydrothermal treatment method. Under heat treatment, temperature and treatment duration, each of four levels was taken as independent variables. Heat treatment was conducted for temperature: 65, 85, 105, 125°C and duration: 2,4,6,8 min. Both the treatments had shown significant effect on milling performance. Under hydrothermal treatment, steam pressure 0.5 kg/cm² for 10min yielded maximum hulling efficiency; 84.527% and finished product recovery; 52.07%. However, among all the heat treatment under the study, temperature 85±5°C for 4min resulted to the maximum hulling efficiency 84.28% and finished product recovery; 53.53%. On the basis of the above observations, hydrothermal treatment at 0.5 kg/cm² for 10 minute is recommended for resource full farmers and for resource poor farmer's heat treatment at 85±5°C for 4 min. Optimized treatments trials on IARI Mini Dal mill successfully yielded finished product recovery of 72.83% and hulling efficiency: 90.47% with pre-milling heat treatment at 85°C for 4 min. The hydrothermal treated lot resulted finished product recovery: 74.96% and milling efficiency: 90.77%. Further increase of product recovery and dehulling efficiency was observed with scouring the kernel before treatment. Cost of processing was found to be 1.25 Rs/kg and 1.60 Rs/kg for heat and hydrothermal pre-milling treatment and milling by IARI Mini Dal Mill, respectively.

Key Words: Optimization, pre-milling method, dehulling efficiency, product recovery.