DESIGN AND FABRICATION OF AN ABRASION TYPE PEELING MACHINE FOR POTATO (*Solanum tuberosam*) TUBERS

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Potato (*Solanum tuberosum*) is one of the important staple foods claiming fourth place in the world. Peeling is an essential basic unit operation in potato processing. Manual peeling with knives consumes more time and labour. In Sri Lanka, it is practised from household to commercial level. Available mechanical methods for potato peeling are high in initial cost and fail to fulfil customers' requirement. Therefore, the objective of this study was to develop and evaluate a motorized rotary drum type abrasion potato peeling machine. The major components of the machine were feeder, rotary abrasion drum, outlet, water spraying unit, draining unit and power transmission system. Potato were continuously fed through the feeder to the abrasion drum while it was rotating and water spraying by the spraying unit. Peeled potatoes were collected from the outlet, at the same time removed peels and waste water flow along the drain. A 3 Hp electric motor was used as power source and belt and pulleys were used to transmit the power. The total cost of the developed peeler was 24,500.00 LKR. Performance of the machine was evaluated compared to manual method. Theoretical peeling capacity, actual peeling capacity, peeling efficiency, average peel loss and damaged fruit percentage of the manual method were 10.9 kgh^{-1}, 8.57 kgh^{-1}, 78.62%, 1.27% and 13.3%, respectively and corresponding figures for the mechanical method were 25.75 kgh^{-1}, 18 kgh^{-1}, 70%, 0.91% and 14%, respectively. Theoretical peeling capacity, actual peeling capacity, mechanical peeling efficiency and average peeling loss were significantly higher in the new method ($p<0.05$). It is concluded that, the newly developed motorized rotary abrasion peeler can be used to peel potatoes more effectively and efficiently than manual method.

Keywords: Abrasion peeling, Mechanical peeling, Motorized rotary abrasion peeler, Potato peeling