

QUALITY IMPROVEMENT IN COTTAGE LEVEL CASHEW PROCESSING
THROUGH INTRODUCTION OF APPROPRIATE TECHNOLOGY

By

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ABSTRACT

In conventional processing, cashew is initially processed at cottage level, and further processed at collecting centers, before it reaches the exporter. Quality defects of kernels were observed to increase as processing proceeded from initial to final stages: Kernels with brown patches increased from 6% to 8%; scratched or scraped kernels from 7% to 8%; and the colour changed from pale ivory to yellow with the score on the hedonic scale rising from 7 to 8. Quality defects averaging 12% were detected in cashew kernels delivered to exporters who rejected 40% of it. Kernels exported averaged 5% defects, failing to meet the quality requirements of Grade I. Inappropriate technology and practices, low knowledge and skill level of processors, and the subsistence nature of cottage level operations contributed to low quality.

The introduction of appropriate technology that included new equipment, processing methodology and practices was identified to address the quality concerns. Improving drying methods, based on the socio-economic and technological surveys conducted, was the key component of the study. The selected tray dryer was modified to suit the requirement of cottage level processing. The modifications were carried out after deriving theoretical values of airflow, temperatures, size of trays and heat exchanger. The dryer was further modified based on field experiments with users. The dryer performance was measured by monitoring the heat distribution and the airflow within the drying chamber against the theoretical values. The quality of processed kernels was compared with the standards stipulated by the buyers. The step wise modification of the dryer resulted in four models that were built on the performance of the previous model. Model

II

IV, named *Anagi*, with a drying temperature between 50-70 °C, and airflow of 0.1-0.7 m/s, was the most appropriate. Fabrication costs *Anagi* dryer were 33% of the cost of original tray dryer and operation difficulties too were comparatively low.

The participatory technology development process adopted, led to accommodation of both user concerns and market requirements. Changes in the sequence of unit operations in processing helped to improve the product quality. The major change brought about in the sequence was the peeling of kernels after drying. Whole kernels were graded by size and packed soon after peeling. The average defects of dried kernels reduced from 12% to 4% and the output of whole kernels increased from 55% to 67% with the use of modified technology. Under experimental conditions, roasting prior to shelling, reduced the time spent on shelling and increased the cost effectiveness of processing, resulting in a higher percentage of whole kernels obtained.

Cottage level processing was not profitable and processing at collecting centers and at exporter level generated financial returns, with an internal rate of return (IRR) of 28% and 34% respectively, in the 'without project' scenario. Profitable cottage level cashew processing with IRR of 33% was recorded in the 'with project' scenario and further analysis showed that the operation using capital borrowed at commercial interest rates (20%) will bring profits. The opportunity cost of labour is low due to unavailability of alternative employment in the dry zone where cashew grows. Poverty alleviation programmes should promote cashew processing effectively by ensuring availability of sustainable services in areas such as credit, appropriate technology, market linkages and information.