


**Determination of an Optimum Warehouse Storage for Better Quality Retention of a Blended Ceylon Black Tea Standard**

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**Abstract**

Ceylon tea maintains a good reputation in the global market and plays a key role in the economic development of Sri Lanka employing a million people. Due to higher competition among tea-supplying countries, assurance of the quality of tea becomes a growing priority to get a competitive advantage. Tea storage conditions are major key factors that directly affect the quality of tea. Temperature and relative humidity (RH) management during tea storage at warehouses and transitions of the value chain plays a pivotal role in maintaining tea quality. This research was conducted to determine optimum warehouse storage for a blended Ceylon black tea standard to optimize tea quality while reducing the cost of storage. The specificity is that the determination of storage takes account of possible quality changing patterns of tea during main storage transitions along the value chain. Tea samples were prepared by packing tea primarily into tea bags, secondarily into paper base foil envelopes, and finally into inner and outer paper boxes. Packed tea samples were then stored at three warehouse cold room storage conditions and ambient warehouse storage condition, having temperature and RH combinations of 20-21°C/32-34%, 23-23.5°C/38-42%, 24.5-25.7°C/63-69% and 27-29°C/66-76% respectively. Tea quality parameters were analyzed first by continuously storing tea samples for a total of seven weeks at the respective warehouse storage conditions. Analysis of the same was continued by moving tea samples through simulated main storage transitions that include warehouse, shipment, and final destination storage. Samples from both approaches were analyzed for moisture, water activity, and total colour. Sensory quality parameters; flavour, colour, aroma, and overall acceptability were analyzed employing hedonic ranking tests with the participation of trained panelists. Tea stored at ambient storage conditions resulted in the highest quality deviations from the recommended levels, compared to tea stored at cold room storage conditions. Among the cold room storage conditions, tea stored at temperature and RH of 20-21°C/32-34% and 23-23.5°C/38-42% resulted in the most desirable levels of all tested quality parameters. Those two storage conditions were not significant ( $P > 0.05$ ) for most of the tested quality parameters. By considering both quality optimization and storage cost reduction, this study determined 23-23.5°C temperature and 38-42% RH combination as the optimum warehouse storage condition.

**Keywords:** *Black tea, quality, value chain, warehouse storage*

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