

Impact of a Modified Sifting Process Model in Pure Orthodox Black Tea Manufacturing for Higher Profitability

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Introduction

Tea is one of the most important cash crops in the world and it plays a very significant role in the Sri Lankan economy too. As a food beverage, tea is second only to water. Sri Lankan black tea is world famous as quality tea. But manufacturers try to increase the production to gain more profits without considering the quality. It will badly affect to the image of Ceylon black tea and our export market will definitely be affected. Therefore, there is need to develop the current tea manufacturing process to earn more profits while increasing the quality of the end product.

Sifting process is a cost sensitive step among the five main steps (withering, rolling, fermentation, drying and sifting) in the black tea manufacturing process (Zoyza, 2008). It demands more workers and electricity, leading to increase in the cost of production (Energy Audit Report of St. Joachim Tea Factory, 2002). But it is a very critical and valuable step as it separates the different tea grades which are produced to cater the market requirements. So the sifting process directly affects the generation of profits in a factory through higher Net Sale Average (NSA) and lower cost of production. Therefore, studying the basic steps of factory current sifting process will show the right direction for the development of modified sifting process model without harming the end product (tea grades) of tea manufacturing (Annual Report, 2011).

The main objective of this research was to check the impact of the Modified sifting process model in pure orthodox black tea manufacturing for higher profits in the factory through increasing the NSA of the tea grades and reducing cost of production by saving worker, energy and time.

Methodology

The study was carried out at St. Joachim Tea Factory, Tea Research Institute, *Ratnapura*. The preliminary studies were conducted first to find the cost sensitive activities and factors in the present sifting process model, which produces black tea with pure orthodox. It has two sifting processes as process I (Figure 1) and process II (Figure 2). Secondly, three modifications (A, B and C) were introduced at three different places in the current sifting process.

Modification A - MC8 (Michi oscillatory sifter mesh no 8) machine was introduced instead of Middleton machine (MT)

Modification B - MC8 machine was introduced instead of MC 10 machine (Michi oscillatory sifter mesh no 10)

Modification C - MC14 machine (Michi oscillatory sifter mesh no 14) was introduced instead of MC 16 machine (Michi oscillatory sifter mesh no 16)

After testing these modifications separately for their outcomes (grades) a modified sifting process model (Figure 3) was developed by incorporating those three modifications.

Then both the current sifting process and the modified sifting process were practiced five times (replicates) separately by using 100 kg of dried tea, while recording the machine working time, number of workers/machine and the usage of electricity for the different machines. A stop watch was used to record the relevant time durations and a KWh meter was used to measure the electricity usage of each machine.

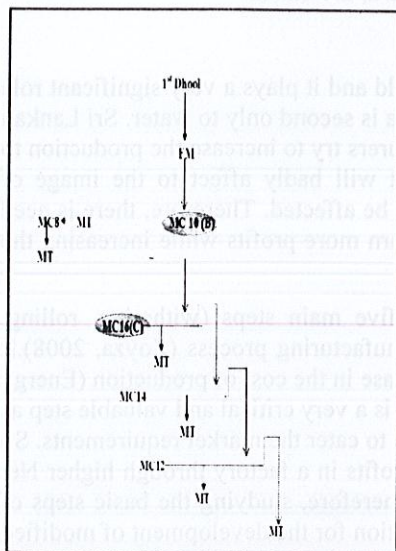


Figure 1: Factory sifting process I

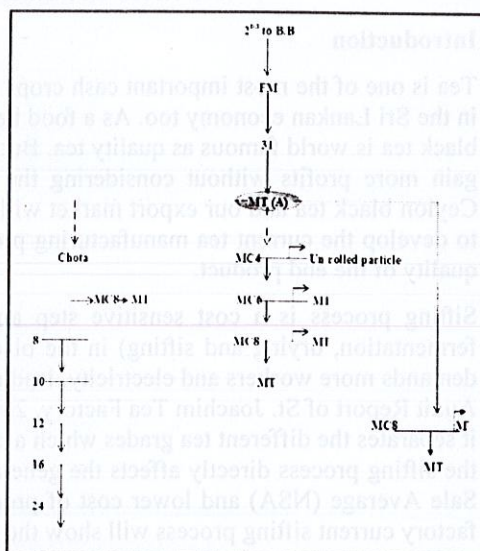


Figure 2: Factory sifting process II

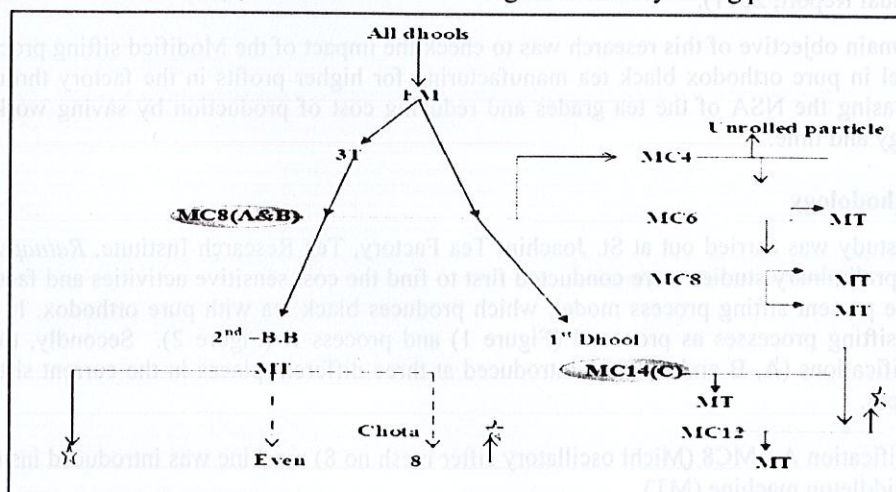


Figure 3: Modified sifting process.

The cost of production (Rs/kg) of the both processes were calculated by summing up the cost for worker wages (no of workers x wages/hr x working time) and cost for electricity

(machine working time x KWh meter reading x unit cost of KWh). The NSA (Rs/kg) was calculated getting the summation of the product weights of different grades produced by each process and their monthly average prices, applying the following equation.

$$\text{NSA} = \frac{\sum (\text{Grade weight} \times \text{Monthly average price})}{\text{Total weight}}$$

Finally calculated data were analyzed using paired t- test with MINITAB statistical package.

Results and Discussion

The evaluation of both processes was done based on the following hypotheses.

- Ho- There is no significant difference between the current factory process and modified process.
- H1- There is a significant difference between the current factory process and modified process.

Table 1. Results of the study

	Cost of production		
	Wages (Rs/kg)	Electricity (Rs/kg)	NSA (Rs/kg)
Factory process	9.25	4.15	457.31
Modified process	7.29	3.48	462.04
Mean difference	1.96	0.17	4.73
T values	79.44	97.15	17.25
P values	0.000	0.000	0.000

According to the results appearing in the Table 1, there are significant differences in both the cost of production and the NSA between the two processes (P value < 0.05).

Conclusion

As NSA is higher and cost of production is lower in modified sifting process than the current factory process, higher profits can be generated in this factory by adopting the modified sifting process with pure orthodox black tea manufacturing.

References

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- Zoyza A.K.N. 2008. Hand Book on Tea, Tea Research Institute of Sri Lanka.