

## Effect of Good Manufacturing Practices (GMP) on Selling Quantity and Price of Ceylon Tea: A Case Study

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### Abstract

Ceylon tea as a beverage has been enjoyed by people all over the world for generations. At present people in the world are increasingly moving towards the healthy foods. When the per capita income is increased people move to quality food. Therefore, product quality certification is the most important point for that situation; because in general consumers always find safety food even though price is high. Sri Lankan food products should be lined with international standard to facilitate the international trade. A study was conducted to identify the effect of Good Manufacturing Practices (GMP) on selling quantity and price of Ceylon tea. Multi-stage proportion sampling method was used to evaluate GMP by using pre-tested questionnaire in all represented administrative regions. Independent sample *t* test recognized the significant difference between selling quantity and GMP value in 58% of GMP value ( $t=2.488, P<0.05$ ) and both selling quantity and price were significantly different with GMP in 50% of GMP value. Selling price and GMP are significantly different in 50% of GMP value ( $t=2.471, P<0.05$ ) and there was a significant different with GMP and selling quantity in 50% of GMP value ( $t=2.377, P<0.05$ ). Based on these results, study reveals the significant effect of GMP on selling price and quantity of tea. According to the results, study recommends the minimum level of GMP as 50% in order to gain profits from Ceylon tea.

**Keywords:** GMP, Price, Quantity, Tea

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### Introduction

Tea (*Camellia sinensis*) is one of the most popular and lower cost beverages. Therefore, tea industry has become a significant contributor to the economics of producing countries such as Kenya, Sri Lanka, India and China (Gunathilaka and Tularam, 2016). Global tea production is 5,173,471 MT and the global consumption is 4,764,000 MT in 2014 (ITC, 2015). Furthermore, in 2015 Sri Lankan tea production was 328.96 m/kg but only 307 m/kg of tea was exported (Sri Lanka Tea Board, 2015). Ceylon tea has a 10% of market share in the international sphere, and one of the world's leading exporters with a share of around 23% of the global demand gain from Tea Packets, Tea Bags, Tea in Bulk, Instant Tea, Green Tea, Flavored Tea, etc., (Perera, 2016). It is in satisfactory level. But in future Ceylon tea may face with a big challenge because with increasing living stand of tea consumers, they demand for high quality safe foods. Therefore, tea industry has to follow the international standard to meet the consumer satisfaction in order to keep the higher demand for Ceylon tea.

Food safety and quality assurance of food increase competitiveness of the food producing companies in national and international markets (Holleran, Bredahl and Zaibet, 1999). Therefore, many institutions have introduced many Food

Safety and Quality certifications such as Good Manufacturing Practices (GMP), Good Hygienic Practices (GHP), ISO 22000; standard set by the international Organization and Hazard Analysis and Critical Control Point (HACCP).

GMP is one of special food safety system certification in tea industry. Because it design to minimize the hazard and enhance the quality of the product in each and every step through the manufacturing process in tea such as leaf standard, withering, rolling, roll breaking, oxidation, drying, cleaning, shifting and hygienic condition Building structure of tea factory are also considered for evaluation of GMP. Ultimately it affects to final product quality. However, GMP is the part of overall HACCP certification and ISO 22000 certification. Therefore GMP is a key requirement for tea industry (Lokunarangodage et al., 2016).

System certification is an important factor for tea factories when capture the international market. For example, European Union (EU) and Japan introduce standard which apply to food safety, quality, agricultural chemical and all residuals in all food product including imported products from other countries. The study was designed to identify the effect of GMP for selling price and quantity of tea in tea factories in Sri Lanka. Increment of price and selling quantity of

tea through the improvement of GMP was main objective of this study. The study was designed to investigate advantage of achieving of GMP for all tea factories in Sri Lanka to gain maximum profit via increment of selling price and quantity. The study was focused to motivate all tea factories to establish GMP for all tea factories in Sri Lanka in order to capturing the international tea market

### Materials and Methods

Seven administrative regions namely, Bandarawela, Matugama, Gampola, Galle, Matara, Ratnapura and Hatton recognized by Sri Lanka Tea Board were selected. Multi-stage proportion random sampling method was used. Accordingly, 35 factories were selected from every region by selecting 5 factories from each region. Then field observation, informal discussion and questionnaire were used to evaluate each factory for GMP. Questionnaire was designed to evaluate section wise GMP performance of each factory. Prices and quantity of tea were used as secondary data that collected from Sri Lanka Tea Board.

The significant difference between GMP based on FSQM (Food Safety and Quality Management) and price and quantity were evaluated by t-test and the descriptive statistics based on the representative sample data. The data of manufacturing process line against the GMP requirement where qualitative data was converted to percentage of each section among total evaluation. Those values obtained from field observations. Descriptively GMP requirement was calculated by dividing the data of GMP in to two categories by considering the cut of point of GMP value.

### Results and Discussion

According to the finding, GMP based on FSQM affected the average quantity sold and the selling prices of tea for factories. According to descriptive statistics in Fig.1 there was a significant difference between selling quantity with GMP in cut of point of 50% of GMP value. There was no significant difference between selling quantity with GMP in below 50% of GMP value.

When GMP value was less than 50%, the average selling quantity recorded as 23154.18 Kg and 40122.49 Kg average selling quantity could be achieved when higher GMP value ( $\geq 50\%$ )

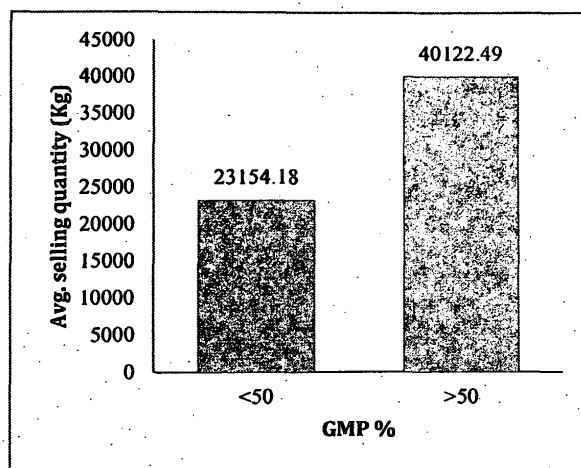


Figure 1: Effect of GMP value on selling quantity of tea in tea factories.

According to descriptive statistics in Fig. 2 there was a significant difference between selling price with GMP in cut of point of 50% of GMP value. There was no significant difference between selling price with GMP below 50% of GMP value.

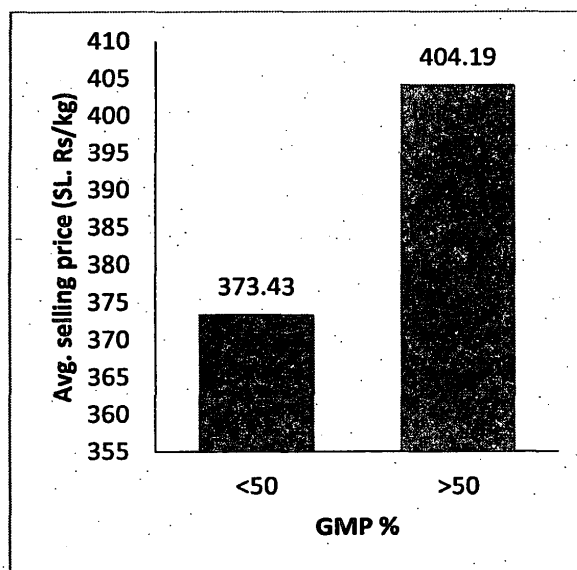


Figure 2: Effect of GMP value on selling price of tea in tea factories.

When GMP value was less than 50%, the average selling price recorded as Rs. 373.43 and Rs. 404.19 average selling price could be achieved when higher GMP value ( $\geq 50\%$ )

Independent sample *t* test recognized the significant difference between selling price and GMP value at 58% of GMP value ( $t = 2.488, P < 0.05$ ) and both selling quantity and selling price were significantly different with GMP at 50% of GMP value. Selling price and GMP significantly

different at 50% of GMP value ( $t=2.471$ ,  $P< 0.05$ ) and there was a significant different with GMP and selling quantity at 50% of GMP value ( $t=2.377$ ,  $P<0.05$ ).

Based on the results, increment of GMP increased the selling price and selling quantity of tea. According to the results, the minimum level of GMP was recorded as 50% of GMP. It means tea factories should achieve at least 50% of GMP to capture international tea market via increment of selling price and selling quantity. Most of tea factories in Sri Lanka do not have clear idea about important of GMP with respect to selling price and selling quantity. This study revealed that importance of GMP with respect to selling price and selling quantity of tea. Most of tea factories in Sri Lanka have not achieved GMP level up to the standard. Results of the study showed that less than 50% of GMP gain tea industry to less profit than higher GMP level. It revealed that when factories increase GMP, more profit for the tea industry. According to the finding, the minimum level to increase selling price and selling quantity was 50% GMP and thereby ensure high profits. Hence government policy should be established to increase factory GMP level up to 50% or more.

It reveals that although the minimum GMP level of GMP was 50%, the GMP level of 58% gave even higher price than below 58% of GMP value. It has been found that limitations such as finance, consultation, knowledge and expertise have become as barriers in implementing GMP in tea factories.

In conclusion, when increment of GMP level increase the selling price and the quantity of tea in tea factories in Sri Lanka and the minimum level of GMP was 50% \. All factories should achieve above 50% of GMP level to gain maximum profit for the tea industry. Tea industry should be motivated to consider GMP level up to the satisfactory level.

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