An Optimal Production Process to Maximize Profit Based on Data from a Factory Producing Orthodox Tea

By

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The work described in this thesis was carried out by me under the supervision of Prof. Sunethra Weerakoon and Mr. D. D. Ananda Gamini and a report on this has not been submitted in whole or in part to any university or any other institution for another Degree/Diploma.

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We certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University for the purpose of evaluation.

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Abstract

The profit of the Tea Shakthi tea factory was calculated by using different production values for all tea grades produced in orthodox tea manufacturing processes. The results indicated that the production of more grades with different production values than the current factory process will increase the profit of the factory by 80%.

A linear programming model was constructed to maximize the profit of the factory by assuming that the total production of the factory was exactly 21.5%. However it varies slightly with the monthly production and the quality of green leaf. For convenience, the cost of producing one kilogram of tea is taken to be a constant by averaging all costs reported. The results obtained will depend on both of these factors but they will not greatly affect the solution because the values taken are reliable and very close to the actual values of the relevant month.

To increase the profit, it is required to change the actual manufacturing process at certain stages and it was revealed that the suggested changes are viable under the existing conditions according to the available sources.

Chapter 1

Introduction

This chapter mainly deals with the history and general knowledge of tea production and the usage of the end product and hence mostly contains quotations.

1.1 Tea

Tea is the most popular non-intoxicating beverage in the world. The three main categories of tea are black, green, and oolong. Within each of these categories there are many varieties. Tea bags were introduced in the twentieth century, and it is the most popular form people like to use.

1.2 Tea Plant

The tea plant is an evergreen of the Camellia family that is native to China, Tibet and northern India. There are two main varieties of the tea plant. The small leaf variety, known as Camellia sinensis, thrives in the cool, high mountain regions of central China and Japan. The broad leaf variety, known as Camellia assamica, grows best in the moist, tropical climates found in Northeast India and China. The plant produces dark green, shiny leaves and small, white blossoms.[3]

1.3 History of Tea

Tea was first discovered by the Chinese emperor Shennong in 2737 BC. When the emperor on a trip to a distant region, he and his army stopped to rest and a servant began to boil water for him to drink. A dead leaf from a wild tea bush fell into the water and it turned a brownish colour and presented to the emperor. The emperor drank it and found it very refreshing, and tea was born. During the period of Chinese emperor Tang Dynasty, tea became a popular drink in China. The legends tell that tea spread along with Buddhism. [3]

1.4 Ceylon Tea

Prior to 1960s, main foreign exchange earner in Sri Lanka was coffee and today tea has taken this position and Sri Lanka is the world's third biggest exporter of tea. The two men responsible for this transformation are James Taylor and Sir Thomas Lipton.

In 1866 the first seeds were planted at Loolecondera by James Taylor the person who introduced tea cultivation to Sri Lanka. The first shipment of Ceylon tea had reached the London auctions in 1875. In 1890, Sir Thomas Lipton bought tea estates from Sri Lanka and sent tea to Britain and at present also his company produces best quality tea. [4]

Ceylon tea from Sri Lanka, acclaims as the best tea in the world has its inherent unique characteristics and reputation running through more than a century. The influence of climate conditions of its plantation imparts to the product a variety of flavors and aromas, synonymous with quality.