Impact of Passenger Load Factor Variability on Average Daily Flight Kitchen Waste in Flight Catering Industry in Sri Lanka

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ABSTRACT

Globally, the airline catering industry produces 630 million meals a year. Variation between classes, the lengths of flights, time of day as well as special or dietary requirements. Food waste management and disposal is one of the most significant issues in the Flight Catering Industry. In this study, Impact of Passenger Load Factor Variability on Average Daily Flight Kitchen Waste in Flight Catering Industry in Sri Lanka was evaluated and identified the Potential Strategies to minimize the Food waste in Flight Kitchens.

The research was conducted in order to analyze, Impact of the Passenger Load Factor (PLF) Fluctuation within 24 Hours to the Estimated Time of Departure (ETD) of an Airline for the Average Daily Flight Kitchen Waste in Flight Kitchen based on the Historical Data of 14 International Airlines, catered by Flight Catering Company. There was a Variability in the Initial Passenger Loads and the Final Passenger Loads provided by the Customer Airline and this has Created uncertainty in the Production Floor. The average daily kitchen Waste per Meal fluctuate throughout the year varying the average Profit margin.

Initial Passenger Load Factor, Final Passenger Load Factor, Passenger Load Factor Variability and Number of Meals Catered per Day are Independent Variables, and the Dependent Variable is Production Waste per Meal (kg). A combination of Descriptive Research, Correlation research and Applied Research were used as Research methods. The population for this study was all the Airlines catered from July to October 2017. The Stratified and Judgmental sampling techniques was used for Sampling Procedure.

Selected Sample for the Study is 75% Percent of Total Meals and the 80% of the Sectors of the Research Period. The Flight Loads data were collected using secondary data collection method and the Production Waste using Primary Data Collection Method. The Data analysis was done using the MINITAB statistical Software. The descriptive data analysis, Simple Linear Regression, Pearson Correlation Coefficient were mainly used in data analysis.

The Production Waste per Meal is reducing with the Increase of the Number of meals per day. The Demand Uncertainty has significantly affect the increase of Waste in the Production Area. The Minimum Waste per Meal has achieved when the Initial Passenger Load factor was 100%.

Irrespective of the month, the Pattern of the Average daily meal count of the Week Day has continued over the period of the research. The highest fluctuations has occurred in the Short Sector Flights. The Business Class Load factor Variance is Minimum in the months which represents the highest Load Factor of the Period of the Research. The Average Pax Loads for all the Classes of the both Airlines has Increased (Positive Variance) representing that the Risk of the increasing of the Loads within Last 24 hours has transferred to the Caterer by the Airline. The Airline has not given a significant provision for potential Load Increases when they place the initial Order to the Caterer. This creates Production Uncertainty whereas the caterer has to take the risk of Last minutes top-ups in advance and produce more than the Initial Order Placed by the Airline creating the Supply Chain Bullwhip effect.

Per meal highest waste and the Standard Deviation was represented by Pre Production area. Minimum waste per Meal and the Standard Deviation was represented by the Confectionery. The highest portion of the average Waste per meal has generated by the Vegetable room then the Hot Kitchen. Total Average Waste per meal has followed the popular Pareto Theory which is 80% of the Average Waste per meal has generated from the Pre-Production (Vegetable Room and Butchery) and the balance 20% has generated for the Other Kitchens (Hot Kitchen, Cold Kitchen, Confectionery and the Bakery). Each sub kitchens has reported the Lowest Average Waste per meal on the Peak period with highest Meal Count of the Research period. The Highest waste has reported in the off-Peak Months. The provision for the potential increases has caused the Average waste per meal due to the uncertainty in the production line, due to the non-availability of an accurate forecast for Final Passenger Loads.

Per Meal Waste Variation was high in Pre- Production (Vegetable Room and Butchery), because multiple factors have affected the Pre- Production Waste such as Seasonality, Quality of the Raw Material. The First Class Meal which has led to an increase of the waste, because the kitchens produce customized products for the First Class Meals with less Standardization and the Lack of mass Production and the practice of Production for First Class Meals.

The Hypothesis test reveals that the Mean Waste per Meal values of Different Sectors are Equal, Mean Waste per Meal values of Different Months are Not Equal, The Mean Waste per Meal values of Week Days are Not Equal. The Pearson Correlation Analysis represents, the Pre-preparation in

Vegetable Room and butchery has minimized the risk of increasing the Loads at the Last 24 hours by producing for Configuration (Full Passenger Loads). The Impact of the Variability of the Passenger Load Factors was very minimum for the Average Waste per Meal in Confectionery and Bakery Compared to hot kitchen and Cold kitchen due to the sensitivity of the Outputs, Standardization and the number of Components and the processes of the Meals.

The risk of waste generated by not increasing the Passenger Loads will have to bear by the Caterer according to the Current Situation. The supply chain uncertainty has created the producer to produce more than the Initial Passenger Loads to cater the passenger load increases in last 24 hours to the estimated time of Departure. All the factors analyzed are scientifically significant for the total Waste in Production Department, indicates that the importance of developing a method to control the Uncertainty in the Production department on Passenger Loads of Customer Airlines.

The Study Recommended to Develop a Proper Forecasting System and Implement a Meal Bank (Standard Meal Store to Cater the Late Additions) system to Minimize the Production Waste with Strategic Menu Planning.

Keywords: Food waste, Flight Catering Industry, Passenger Load Factor, Variability, Initial Pax Load, Final Pax Load, Estimated Time of Departure

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LIST OF ACRONYMS

PLF - Passenger Load Factor

ETD - Estimated Time of Departure

ATD - Actual Time of Departure

FC – First Class

BC – Business Class

PEY – Premium Economy Class

EY – Economy Class

SPML – Special Meals

CCP- Critical Control Points

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