
Optimizing Onboard Catering Loading Locations and Plans for Airlines

Seren Bilge Yilmaz*¹ and Eda Yucel¹

¹TOBB University of Economics and Technology [Ankara] – Turkey

Abstract

Airlines serve complimentary or for-purchase in-flight meals that vary depending on the length of flight. These meals are prepared by airline caterers and are ideally loaded just before the flight. However, as it is costly to have correct amount of meal at the departure airport just before each flight, airline companies carry out meal loading at predetermined airports. In general, the loading sites (airports) are two types as normal or cross. At normal loading sites catering can be loaded directly to the aircraft with a loading cost, whereas at cross loading sites before loading catering should be transported from a normal loading site with an additional transportation cost. Although flight plan changes dynamically, airlines determine meal loading sites before each season based on the established flight plan and estimated amount of meal consumed at each flight. In this study, given flight plan for a specified planning horizon and estimated demand for each meal type, we address the problem of determining normal and cross loading sites. The objective is to minimize total operational costs including fixed costs of opening loading sites, loading costs, transportation costs for cross loading and aircraft fuel costs. The aircraft meal capacity and life time for each meal should be considered. We develop a mathematical model and a tabu search algorithm for the problem. We analyze their performance on realistic problem instances obtained from a well-known airline company in Turkey.

Keywords: Airline Applications, Metaheuristics, Facility Location

*Speaker