

INTISARI

Pertumbuhan industri makanan beku di Indonesia didorong oleh perubahan pola konsumsi masyarakat yang mengedepankan kepraktisan dan kesadaran akan kesehatan. PT X sebagai mitra distribusi produk makanan beku di area Solo Raya menghadapi tantangan dalam mengelola distribusi ke sekitar 600 toko setiap minggunya dengan biaya operasional yang tinggi dan perencanaan rute yang belum optimal. Penelitian ini bertujuan untuk menganalisis efisiensi biaya dan menentukan rute optimal distribusi terbaik dengan menggunakan metode **Saving Matrix**, serta membandingkannya dengan algoritma **Nearest Neighbor** dan **Nearest Insert**. Metode Saving Matrix dipilih karena mampu menghasilkan rute yang lebih pendek dan efisien untuk pengiriman multi-titik. Hasil penelitian menunjukkan bahwa penerapan algoritma Nearest Insert dalam metode Saving Matrix menghasilkan rute distribusi paling optimal dengan produktivitas mencapai **85,29%** dan potensi **penghematan biaya sebesar 14,71%** dibandingkan rute eksisting. Temuan ini menunjukkan bahwa optimasi rute distribusi melalui pendekatan matematis dapat secara signifikan menurunkan biaya operasional dan meningkatkan efektivitas distribusi, serta memberikan dasar perbaikan strategis dalam manajemen logistik PT X.

Kata kunci: Distribusi, Frozen Food, Saving Matrix, Nearest Insert, Efisiensi Biaya, Optimasi Rute

Abstract

The growth of the frozen food industry in Indonesia is driven by changing consumer behavior that prioritizes convenience and increasing awareness of health. PT X, as a distribution partner for frozen food products in the Solo Raya area, faces challenges in managing weekly deliveries to approximately 600 stores, with high operational costs and suboptimal route planning. This study aims to analyze the efficiency of distribution costs and determine the most effective distribution routes using the Saving Matrix method, comparing it with the Nearest Neighbor and Nearest Insert algorithms. The Saving Matrix method was selected for its ability to generate shorter and more efficient multi-drop delivery routes. The results of the study indicate that the Nearest Insert algorithm provides the most optimal distribution route, achieving a productivity level of 85.29% and a potential cost savings of 14.71% compared to the existing route. These findings demonstrate that route optimization through mathematical approaches can significantly reduce operational costs and improve distribution effectiveness, offering a strong foundation for strategic improvements in PT X's logistics management.

Keywords: Distribution, Frozen Food, Saving Matrix, Nearest Insert, Cost Efficiency, Route Optimization