

ABSTRACT

The fluctuation in red bird's eye chili prices is a strategic issue in Indonesia's food security, particularly during the period of Ramadhan. The sharp increase in demand during this month is often not matched by stable supply, resulting in significant price spikes. This study aims to analyze seasonal patterns and forecast red chili prices in Bekasi City during Ramadhan using the Holt-Winters Exponential Smoothing method. The data used are secondary, weekly-scaled, and cover the period from January 2021 to March 2025, obtained from the National Strategic Food Price Information Center (PIHPS). The research process includes data collection, cleaning, transformation, model design using the additive Holt-Winters approach, and accuracy evaluation using four metrics: MAE, MSE, RMSE, and MAPE. Three parameter tuning strategies were compared—default (untuned), automatic (optimized=True), grid search, and manual (trial and error). The manual tuning approach achieved the best performance, with a MAPE of 11.92% and an RMSE of 13,363.34, indicating good forecasting accuracy. The model successfully captured yearly seasonal patterns and produced stable predictions that closely reflect real conditions. These findings support the use of Holt-Winters as a data-driven forecasting tool for seasonal food price trends, and it is expected to assist stakeholders in preparing price stabilization strategies ahead of Ramadhan.

Keywords—*chili price prediction, Holt-Winters, price fluctuation, Ramadhan, time series*