

ABSTRACT

Accurate cattle selling price prediction plays a crucial role in supporting decision-making in the livestock sector; particularly for small-scale farmers who still rely on manual recording. This study aims to develop and evaluate a cattle selling price prediction model using the K-Nearest Neighbors (KNN) regression algorithm. The data used are 605 historical data from PD. Berkah Farm, covering the period 2021 to 2025, with features such as cattle type, age, weight, sex, season, and operational costs. The research method includes data preprocessing (encoding and normalization), KNN modeling, and parameter tuning using GridSearchCV with K-Fold Cross Validation to determine the optimal K value. The best results were obtained at a K value of 8 with evaluation metrics in the form of MAE of 0.0276, MSE 0.0023, RMSE 0.0483, MAPE 0.8712%, MPE 9.60%, RMSPE -5.21%, and R^2 of 17.03%. Although the R^2 value shows that the model's predictive ability is still limited, the KNN method is still worth using because it is simple, easy to implement, and able to provide quite competitive prediction results for limited data.

Keywords: : Cattle Price Prediction, Cross Validation, GridSearchCV, K-Nearest Neighbors, Machine Learning, Regression.

ABSTRAK

Prediksi harga jual sapi yang akurat memiliki peran penting dalam mendukung pengambilan keputusan di sektor peternakan, terutama bagi peternak skala kecil yang masih bergantung pada pencatatan manual. Penelitian ini bertujuan untuk membangun dan mengevaluasi model prediksi harga jual sapi menggunakan algoritma K-Nearest Neighbors (KNN) regresi. Data yang digunakan sebanyak 605 data historis dari PD. Berkah Farm, mencakup periode 2021 hingga 2025, dengan fitur seperti jenis sapi, usia, berat, jenis kelamin, musim, dan biaya operasional. Metode penelitian meliputi tahapan preprocessing data (encoding dan normalisasi), pemodelan KNN, serta tuning parameter menggunakan GridSearchCV dengan validasi K-Fold Cross Validation untuk menentukan nilai K optimal. Hasil terbaik diperoleh pada nilai $K = 8$ dengan metrik evaluasi berupa MAE sebesar 0.0276, MSE 0.0023, RMSE 0.0483, MAPE 0.8712%, MPE 9.60%, RMSPE -5.21%, dan R^2 sebesar 17.03%. Meskipun nilai R^2 menunjukkan kemampuan prediksi model masih terbatas, metode KNN tetap layak digunakan karena sifatnya yang sederhana, mudah diimplementasikan, serta mampu memberikan hasil prediksi yang cukup kompetitif untuk data yang terbatas.

Kata Kunci: Cross Validation, GridSearchCV, K-Nearest Neighbors, Machine Learning, Prediksi Harga Sapi, Regresi.