MODELING AND FORECASTING THE MILK PRODUCTION DEFICIT IN SRI LANKA

N.M.N.C. Nelumdeniya, A.M.K.R. Bandara and A.I.Y. Lankapura

Department of Agricultural Systems, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.

Present milk production in Sri Lanka is insufficient to meet domestic consumption and the milk production deficit is widening over the years. Sound knowledge on potential production deficits is essential to develop an appropriate strategy for achieving self-sufficiency in milk production. The existing literature on forecasting the milk production deficit related to the Sri Lankan context is lacking. Thus, the objective of this study is to estimate the future milk production deficits: the difference between annual forecasted milk production and consumption. Secondary time series data used for the study include annual milk production (1998-2019), annual population (1960-2019), recommended and present per capita milk consumption. The annual milk production and population were modeled by fitting different time series and regression models. The best predictive models were identified using the mean absolute percentage error (MAPE) criterion. The non-linear quadratic trend model was identified as the best model for predicting milk production with the lowest MAPE (3.18). The quadratic regression model was identified as the best predictive model for population data (MAPE=0.5). The milk consumption of a given year was calculated by multiplying the estimated population by the per capita milk consumption. The model forecasts 21.71 million population and 701.96 million litres of milk production in the year 2025 indicating a 2.12% and 36.3% increase respectively compared to the present figures. Therefore, the estimated milk production deficit by the year 2025 based on the current average consumption (47.52 liters/year) and based on recommended consumption level (82.5 liters/year) is 329.8 million litres and 1089.3 million litres respectively. This indicates that a 32% production deficit to consume at the present rate and a 63% production deficit to consume at the recommended level in the year 2025. Therefore, appropriate strategies should be introduced to reduce this deficit and achieve self-sufficiency.

Keywords: Mean absolute percentage error, Milk consumption, Milk production, Quadratic trend model