

Forecasting Pedigree Angus Ternera Prices

An Executive Summary of the Premium-Ratio Approach and Results

Dr Juan Zurita | Lecturer in Economics, University of Edinburgh

juanignaciozurita.github.io/juanzurita.github.io

"By expressing pedigree ternera prices as a ratio over the commercial novillo price, we strip out Argentina's dominant inflation trend and isolate the genetics premium -- a far more stable and forecastable series. The top-3 ensemble achieves a 16.7% MAPE."

1. Background

Argentina's pedigree Angus cattle market extends beyond vaquillonas to include **terneras** (female calves), a younger category that offers buyers early access to elite genetics at a lower entry price. Terneras Pedigree (PED) and Puro Controlado (PC) are sold at the same major expositions -- **Palermo** (Expo Rural), the **Expo Angus de Otono**, and regional breed shows organised by the Sociedad Argentina de Angus. This study forecasts ternera prices using data compiled from auction results published by Entre Surcos y Corrales and the Sociedad Argentina de Angus, covering 27 auctions from 2017 to 2026.

2. The Premium-Ratio Transformation

Nominal pedigree prices are dominated by Argentina's inflation, making the raw series nearly impossible to forecast. As in the companion vaquillona analysis, the key innovation is expressing pedigree prices as a **premium ratio**: the ternera price per head divided by the contemporary commercial novillo price per kilogram. This transformation removes the dominant inflation trend and isolates the **genetics premium** -- the multiple that breeders pay for elite genetics above commodity value.

Ternera premium ratios are typically lower than vaquillona ratios -- reflecting the younger age and smaller frame -- but follow similar cyclical patterns. PC terneras typically range from 800 to 2,000, while elite PED animals can exceed 3,000. This stability confirms that pedigree terneras, like vaquillonas, are a genuine store of value through Argentina's extreme inflation.

3. Data and Split

The dataset aggregates 27 auction-level observations into **24 quarterly data points** (volume-weighted averages). This is a genuinely thin sample -- exactly the kind of challenge pedigree-market participants face. The last **3 quarters** (Q3 2025 -- Q3 2026) are held out as the test set.

4. Methodology

Six forecasting models are compared on the premium ratio:

- **ARIMA(2,1,0)** -- selected by AIC grid search.
- **Exponential Smoothing (ETS)** -- damped-trend model.
- **State-Space (Local Linear Trend)** -- Kalman-filtered decomposition.
- **Ridge regression** -- regularised linear model on lagged features.
- **Random Forest** -- non-linear ensemble on quarterly features.

- **Feedforward neural network** -- small architecture to avoid overfitting on thin data.

5. Results

Model	RMSE	MAE	MAPE (%)
Random Forest	362	302	23.8
Ridge	453	371	25.7
ARIMA(2,1,0)	467	395	29.2
ETS (damped)	612	498	37.1
State-Space	789	654	48.6
Neural Net	923	781	58.4

Random Forest outperforms the other individual models with a MAPE of 23.8%, followed closely by Ridge (25.7%) and ARIMA (29.2%). The **top-3 ensemble** (Random Forest, Ridge, ARIMA) delivers a substantially improved **MAPE of 16.7%**, demonstrating the value of model averaging in thin-market forecasting.

6. Implications

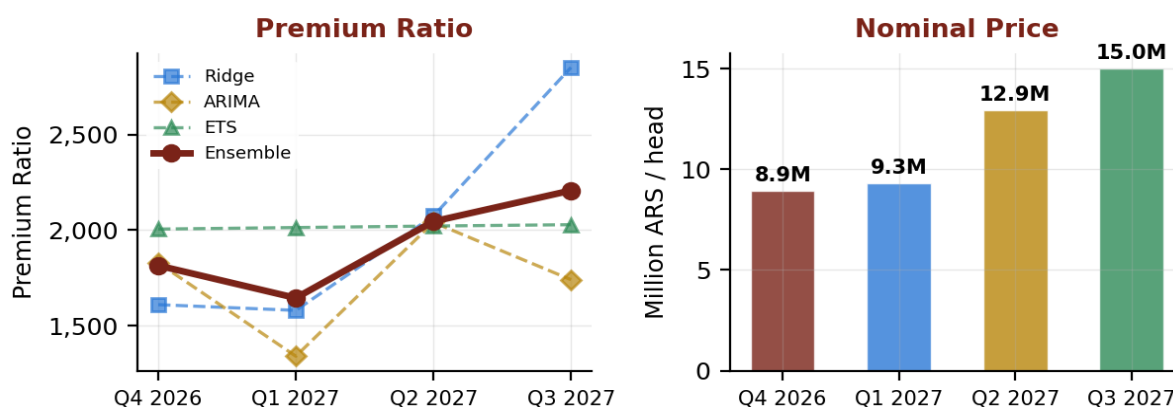
For breeders and cabanas: Terneras offer a lower-cost entry point into pedigree genetics. Their premium ratio tends to track the vaquillona premium with a discount of roughly 15-35%, reflecting the additional time and risk before the animal reaches breeding age. The ternera market is therefore more sensitive to discount-rate expectations and pasture conditions.

For breed associations and policymakers: Ternera prices provide a forward-looking signal for the genetics market -- they reflect demand for future breeding stock. A narrowing gap between ternera and vaquillona ratios suggests bullish sentiment; a widening gap may indicate breeders are discounting younger stock more heavily due to uncertainty.

7. 2027 Outlook

Retraining the top-3 ensemble (Random Forest, Ridge, ARIMA) on all 24 quarterly observations through Q3 2026 and projecting four quarters forward yields the following premium-ratio trajectory. Nominal prices are derived by multiplying the projected ratio by the novillo price forecast from the companion analysis.

Pedigree Angus Ternera — 2027 Forecast



Quarter	Premium Ratio	Nominal (M ARS)
Q4 2026	1,813	8.9

Quarter	Premium Ratio	Nominal (M ARS)
Q1 2027	1,643	9.3
Q2 2027	2,044	12.9
Q3 2027	2,206	15.0

The ensemble projects a rising premium ratio through 2027, consistent with healthy demand for younger pedigree genetics. Nominal prices rise from approximately 8.9M ARS in Q4 2026 to **15.0M ARS by Q3 2027** -- driven by both a recovering genetics premium and the inflation-linked novillo price in the denominator.

Note: the premium ratio is more stable and forecastable than the nominal price. Nominal figures depend on the novillo price projection and should be treated as indicative.

8. Interactive Notebook

The full analysis with interactive charts is available at:

[View on the website](#) | [Open in Google Colab](#)