

Forecasting Pedigree Angus Vaquillona Prices

An Executive Summary of the Premium-Ratio Approach and Results

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"By expressing pedigree vaquillona 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 14.8% MAPE."

1. Background

Argentina's pedigree Angus cattle market is concentrated in elite auctions held at major expositions -- **Palermo** (Expo Rural), the **Expo Angus de Otono**, and regional breed shows organised by the Sociedad Argentina de Angus. Pedigree (PED) and Puro Controlado (PC) vaquillonas represent the top tier of breeding stock, commanding prices that can reach several million ARS per head. This study forecasts these prices using data compiled from auction results published by Entre Surcos y Corrales and the Sociedad Argentina de Angus, covering 28 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. The key analytical innovation is expressing pedigree prices as a **premium ratio**: the vaquillona 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.

The resulting series is far more stable: premium ratios typically range from 1,000 to 2,500 for PC vaquillonas and 2,000 to 10,000 for elite pedigree animals, with a quarterly mean around 2,000. This stability confirms that pedigree cattle are a genuine store of value -- their genetics premium holds through Argentina's extreme inflation.

3. Data and Split

The dataset aggregates 28 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(0,1,1)** -- 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 (%)
Ridge	572	446	29.8
ARIMA(0,1,1)	602	460	30.6
ETS (damped)	891	698	46.5
State-Space	1,138	919	61.2
Random Forest	1,285	1,058	69.3
Neural Net	1,394	1,175	77.5

With only ~21 training points, the simpler models prevail: Ridge and ARIMA achieve MAPE around 30%, while complex models overfit. The **top-3 ensemble** (Ridge, ARIMA, ETS) delivers a substantially improved **MAPE of 14.8%**, demonstrating the value of model averaging in thin-market forecasting.

6. Implications

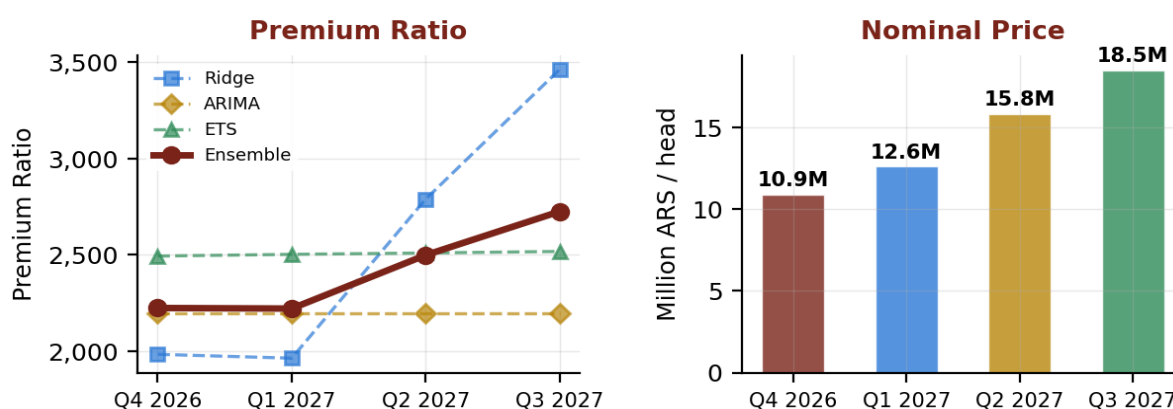
For breeders and cabanas: The premium ratio has been remarkably stable, meaning pedigree cattle are a genuine store of value through Argentina's extreme inflation. Palermo auctions command a persistent 2-3x premium over PC averages, reflecting the championship-certification effect.

For breed associations and policymakers: A rising premium ratio signals healthy demand for genetic improvement -- encouraging for Argentina's long-run beef competitiveness. A persistent fall (as during COVID-19) may indicate breeders under cash-flow pressure liquidating genetics below replacement cost.

7. 2027 Outlook

Retraining the top-3 ensemble (Ridge, ARIMA, ETS) 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 Vaquillona — 2027 Forecast



Quarter	Premium Ratio	Nominal (M ARS)
Q4 2026	2,225	10.9
Q1 2027	2,222	12.6
Q2 2027	2,499	15.8

Quarter	Premium Ratio	Nominal (M ARS)
Q3 2027	2,725	18.5

The ensemble projects a stable-to-rising premium ratio through 2027, consistent with healthy demand for elite genetics. Nominal prices rise substantially -- from approximately 10.9M ARS in Q4 2026 to **18.5M ARS by Q3 2027** -- but this is driven primarily by the inflation-linked novillo price in the denominator rather than a shift in the underlying genetics premium.

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](#)