

Forecasting Argentine Cattle Prices

An Executive Summary of Methodology, Results, and Policy Implications

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"The best-performing model (Lasso regression) achieves a 3.7% out-of-sample MAPE, and a top-3 ensemble reduces this to 4.4% -- accurate enough to inform policy decisions on export quotas and inflation monitoring."

1. Background

Argentina is one of the world's largest beef producers, and cattle prices at the **Mercado Agroganadero S.A.** (Buenos Aires) are a key indicator for agricultural policy, rural incomes, and consumer inflation. The *Indice Novillo* (steer price, ARS/kg live weight) is the benchmark series tracked by the Ministerio de Agricultura, breeders, and feedlot operators. This study applies eight forecasting techniques to 302 monthly observations spanning June 2001 to July 2026, drawing on official data from MAGyP, CEIC, and market intelligence from Consignatarias and Entre Surcos y Corrales.

2. Data

The dataset comprises **302 monthly observations** of the novillo price (ARS/kg live weight), anchored by 91 verified data points from official and market sources. The series is non-stationary, reflecting Argentina's high and volatile inflation regime: the nominal price rose from approximately 1 ARS/kg in 2001 to over 4,300 ARS/kg in 2026. Five structural breaks are identified: the 2002 convertibility collapse, the 2008 global financial crisis, the 2018 peso crisis, the 2020 COVID-19 lockdown, and the December 2023 Milei inauguration.

A train/test split holds out the **last 12 months** (August 2025 -- July 2026) as the out-of-sample evaluation period.

3. Methodology

Eight forecasting models are compared, spanning classical econometrics, machine learning, and deep learning:

- **ARIMA(2,1,2)** -- selected by AIC grid search over log-prices.
- **Exponential Smoothing (ETS)** -- damped-trend model on log-prices.
- **VAR** -- jointly models novillo price, USD/ARS exchange rate, and corn (feed) costs.
- **State-Space (Local Linear Trend)** -- Kalman-filtered decomposition.
- **Ridge and Lasso regression** -- regularised linear models on engineered features (lags, rolling stats, calendar indicators).
- **Random Forest** -- non-linear ensemble of decision trees.
- **LSTM neural network** -- recurrent architecture on windowed log-return sequences.

4. Results

Model	RMSE	MAE	MAPE (%)
Lasso	206	151	3.7
Ridge	212	159	3.8
LSTM	333	261	6.4
Random Forest	338	268	6.6
ARIMA(2,1,2)	349	268	6.7
ETS (damped)	431	361	8.7
State-Space	530	468	11.2
VAR	694	602	14.4

Regularised linear models (Lasso and Ridge) outperform all competitors, achieving MAPE values below 4%. The **top-3 ensemble** (Lasso, Ridge, Random Forest) delivers a combined **MAPE of 4.4%**. Classical time-series models (ARIMA, ETS, VAR) perform adequately but are less competitive in this inflation-dominated environment, where engineered features capturing trend momentum prove more informative than autoregressive structure alone.

5. Policy Implications

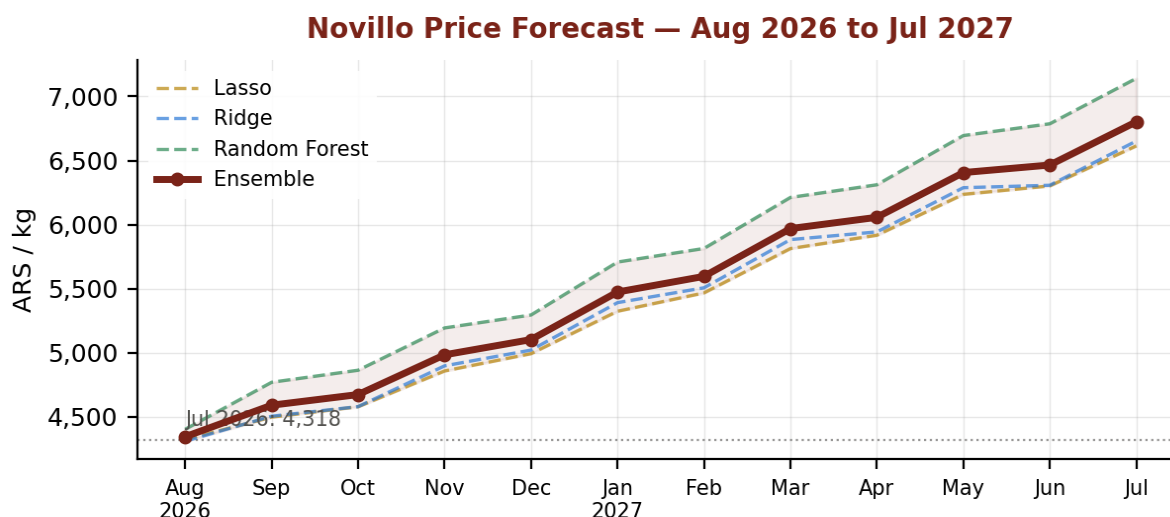
For policymakers: Beef prices account for 7--8% of Argentina's CPI basket. Accurate short-term forecasts allow the Ministerio de Economía to anticipate inflationary pressures and calibrate export quotas (retenciones) without relying solely on lagging official statistics.

For breeders and feedlot operators: The 12-month forecast horizon covers a full retention/sale cycle. Producers can use the model-comparison framework to time decisions on calf retention, feed purchases, and sale scheduling against seasonal price patterns.

For students and researchers: The notebook provides a rich case study in non-stationary, inflation-affected time series with model comparison across eight families -- suitable for courses in applied econometrics, forecasting, and machine learning.

6. 2027 Outlook

Retraining the top-performing ensemble (Lasso, Ridge, Random Forest) on all available data through July 2026 and projecting forward 12 months yields the following price trajectory. These are recursive one-step-ahead forecasts using the same feature-engineering pipeline validated out-of-sample.



Period	Ensemble (ARS/kg)	Change vs Jul 2026
H2 2026 avg	4,739	+10%
H1 2027 avg	6,110	+42%
Jul 2027	6,802	+58%

The ensemble projects a continued upward trend, with the novillo price rising from 4,318 ARS/kg in July 2026 to approximately **6,802 ARS/kg by July 2027** -- a 58% increase driven largely by inflation pass-through. The three constituent models show close agreement, with the range narrowing to 6,614--7,141 ARS/kg by mid-2027.

Note: these projections assume no major structural break (e.g. a new export-quota regime or sharp devaluation). They should be updated as new monthly data become available.

7. Interactive Notebook

The full analysis, including interactive Plotly charts with hover tooltips, is available as a Jupyter notebook at:

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