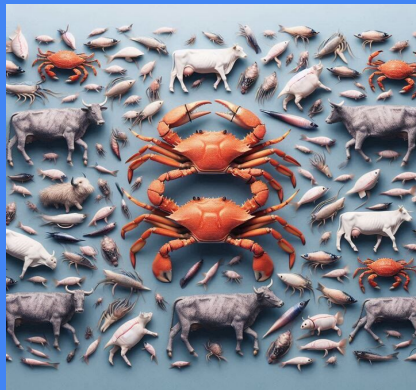


# "Crabs, Cows, and Chaos: Forecasting the Future of Meat & Seafood"

Using past meat and seafood consumption data to predict future needs across the world



# Key Question

How can we accurately forecast future meat and seafood demand to support global supply chain planning and meet evolving consumption needs?

# Executive Summary

- By Leveraging consumption data from over 100 countries, our machine learning model predicts annual meat and seafood demand for future consumption
- Our model integrates historical data of population and meat consumption trends to predict future demand.
- During our initial analysis, we discovered the population data set from Kaggle was not accurate
- We did pivot to obtain a more accurate population data source from [Our World in Data](#)

# The Solution

## Comprehensive Data Collection

Compiled historical meat and seafood consumption data from 100+ countries, with population and meat consumption historical trends.

## Machine Learning Model

Developed an advanced predictive simulation using linear, lasso, and ridge regression models, to analyze population and consumption trends, projecting future meat and seafood demand.

## User-Driven Predictive Insights

Combined user-provided input to generate country-specific population and meat consumptions forecasts using 3 machine learning models.



# Snapshot of the Metric Outputs

## Model Metrics

### Linear Regression

#### Population Metrics

**Mae:** 580.34

**Mse:** 413.09K

**R2:** 0.97

**Rmse:** 642.72

#### Meat Consumption Metrics

**Mae:** 4.28

**Mse:** 30.47

**R2:** 0.63

**Rmse:** 5.52

### Lasso Regression

#### Population Metrics

**Mae:** 580.33

**Mse:** 413.08K

**R2:** 0.97

**Rmse:** 642.72

#### Meat Consumption Metrics

**Mae:** 4.28

**Mse:** 30.47

**R2:** 0.63

**Rmse:** 5.52

### Ridge Regression

#### Population Metrics

**Mae:** 578.13

**Mse:** 410.88K

**R2:** 0.97

**Rmse:** 641.00

#### Meat Consumption Metrics

**Mae:** 4.33

**Mse:** 31.33

**R2:** 0.62

**Rmse:** 5.60

# Conclusions

- What's important is that we look at key metric outputs being generated by the models to determine which models give us the most accurate output
- One model doesn't necessarily perform better than the other- data and criteria selection is what determines the quality of the prediction
- Some of the population predictions are presenting as over fitting with attempts to use Gaussian and Noise to address the over fitting.
- Further analysis should be performed to analyze the features using SimpleImputer, TimeSeries, and Cross-Validation techniques

# Additional Questions

- **How resilient are our demand forecasts in the face of global disruptions (e.g., pandemics, climate change, geopolitical conflicts)?**
- **What key factors will most influence poultry and seafood consumption trends beyond 2030?**
- **How can supply chains adapt to meet projected demand while minimizing waste and inefficiencies?**