Business Analysis of Annual Food Imports by Source Country

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Overview

- Client is the owner of a local grocery store
- **Problem:**
  - Client is looking to improve capacity in one of the major food groups - Dairy, Fruit, Grains, Vegetables, Meat
  - Given that expansion in each of these areas requires capital, our client wants to be sure that he is increasing in the correct area
- Client understands that imports to the United States have been increasing over the last years due to policy change
- Task:
  - Develop a model to accurately predict which food group will increase the most in 2018, and provide recommendation on where the client should allocate his funds.
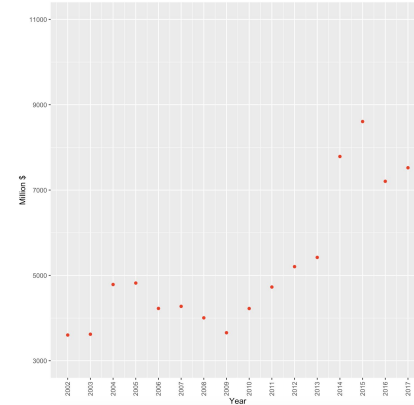
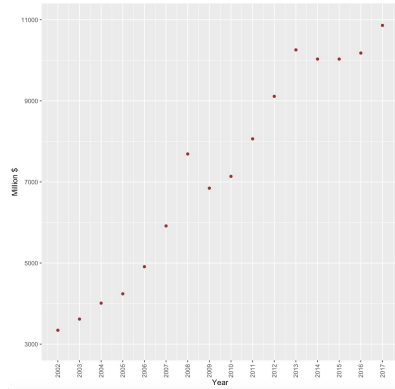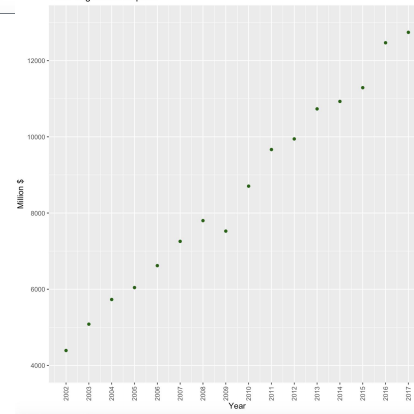# Exploratory Analysis

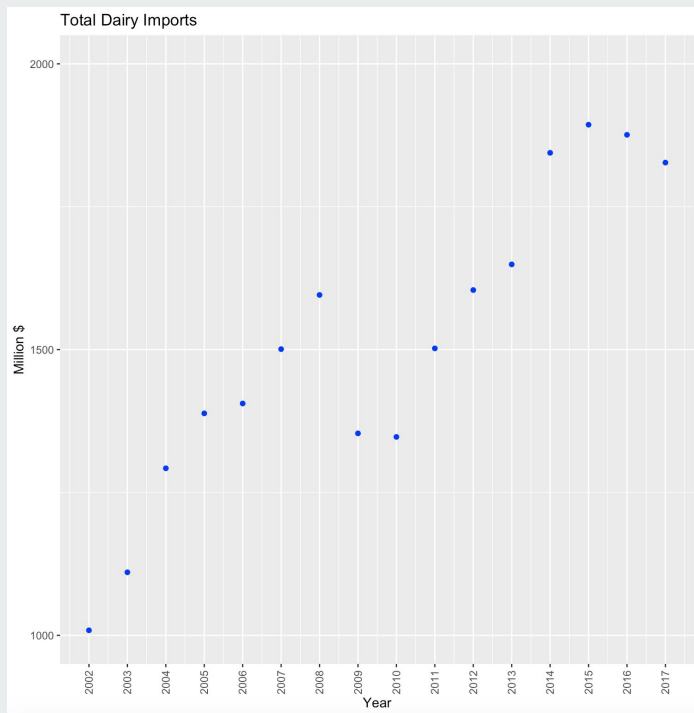Total Fruit Imports
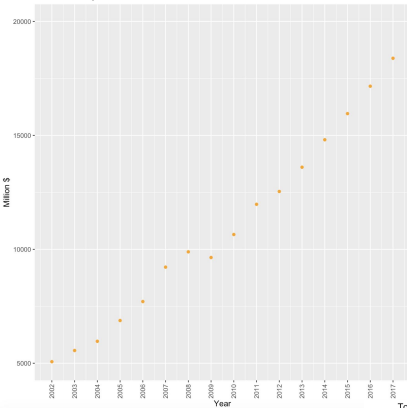
Total Dairy Imports
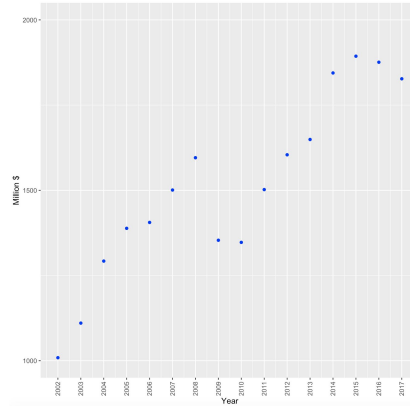
Total Meat Imports

Total Grain Imports

Total Vegetables Imports

Dairy

Total Dairy Imports

Regression Type: Second Degree Polynomial

Prediction Equation:

Dairy_pred = 1114.07 + 57.15 * (Year since 2002) - 0.39 * (Year since 2002)^2

Relevant Number:

Adjusted R-squared: 0.8172

P-value: 6.299e-06 (<0.05)

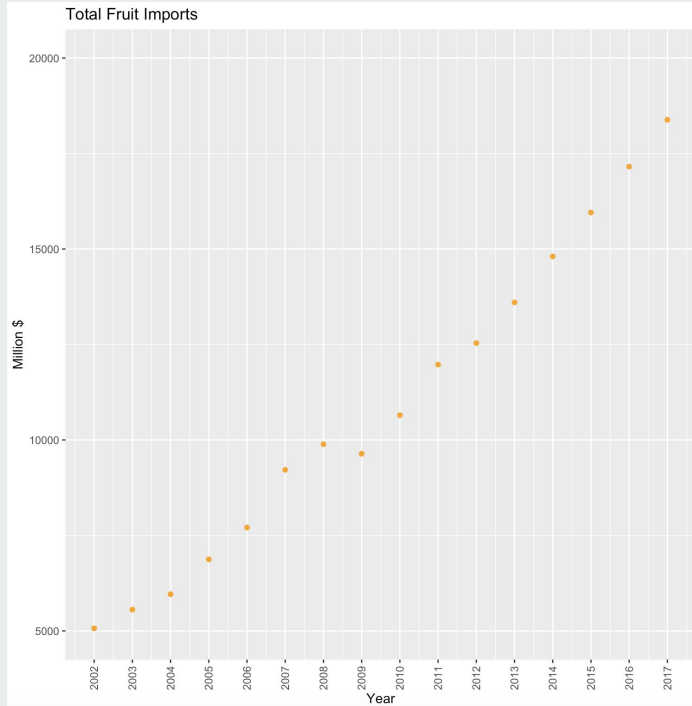**2015-2017 Dairy Imports:**

2015: $1.894B, **2016:** $1.876, **2017:** 1.827B

Projected 2018 Dairy Imports: $1.929B

Percentage Change from 2017-2018:

1.827B → 1.929B ~ 5.55% Increase

Fruit

Total Fruit Imports

Regression Type: Linear Regression

Prediction Equation:

Fruit_pred = 4351.90 + 877.90 * (Year since 2002)

Relevant Number:

Adjusted R-squared: 0.9843

P-value: 2.995e-14 (<0.05)

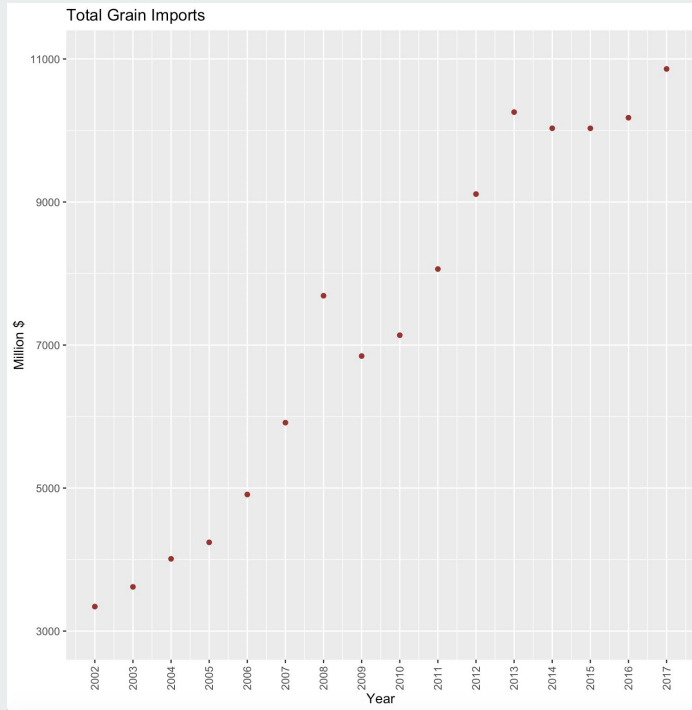**2015-2017 Fruit Imports:**

2015: $15.955B, **2016:** 17.157B , **2017:** 18.383B

Projected 2018: $18.398B

Percentage Change from 2017-2018: 0.08%

18.383B → 18.398B ~ 0.08% Increase

Grains

Total Grain Imports

Regression Type: Linear Regression

Prediction Equation:

Grains_pred= 3170.90 + 545.90 * (Year since 2002)

Relevant Number:

Adjusted R-squared: 0.9539
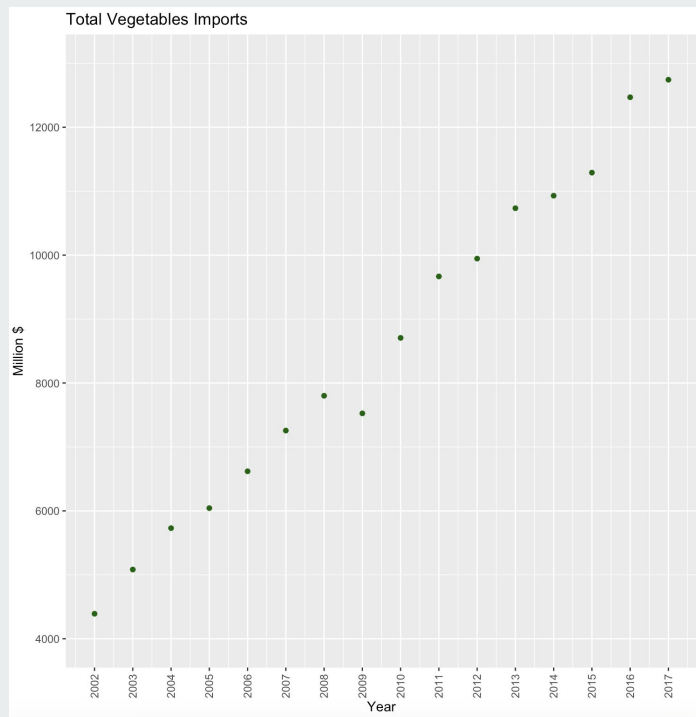
P-value: 5.829e-11 (<0.05)

2015-2017 Grains Imports:

2015: $10.030B, **2016:** $10.179B , **2017:** $10.861B

Projected 2018: $11.905B

Percentage Change from 2017-2018: 9.62%

10.860B → 11.905B ~ 9.62% Increase

Vegetables

Total Vegetables Imports

Regression Type: Linear Regression

Prediction Equation:

Vegetables_pred = 4416.90 + 552.2 * (Year since 2002)

Relevant Number:

Adjusted R-squared: 0.9897

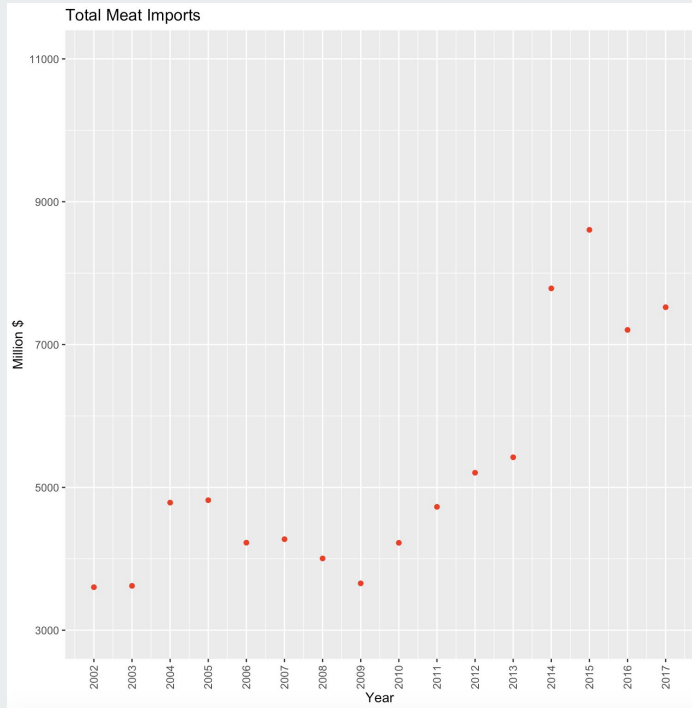P-value: 1.609e-15 (<0.05)

2015-2017 Vegetables Imports:

2015: $11.290B , **2016:** $12.469B, **2017:** $12.743B

Projected 2018: $13.252B

Percentage Change from 2017-2018: 4.00%

12.743B → 13.252B ~ 4.00% Increase

Meat

Total Meat Imports

Regression Type: Linear regression

Prediction Equation:

Meat_pred= 2857.21 + 279.22 * (Year since 2002)

Relevant Number:

Adjusted R-squared: 0.6404

P-value: 0.0001196 (<0.05)

2015-2017 Meat Imports:

2015: $8.606B , **2016:** $7.205B , **2017:** $7.523B

Projected 2018: $7.325B

Percentage Change from 2017-2018: -0.02%

7.522B → 7.325B ~ 0.02% Decrease

Summary

| Type of food	Type of model	Percent change	Adjusted R-squared
Dairy	Second Degree Polynomial	5.55% Increase	0.8172
Fruit	Linear	0.08% Increase	0.9843
Grains	Linear	**9.62% Increase**	0.9539
Vegetables	Linear	4.00% Increase	**0.9897**
Meat	Linear	0.02% Decrease	0.6404

Recommendation

- Our recommendation is for our client to invest in capital for **Grains**
  - Grains has the highest projected growth at 9.63% from 2018-2019
  - While it does not have the highest adjusted R^2, our model is shown still be a good predictor - less 5% of the variation in year cannot be explained by the variation in imports

Potential Improvements to our Model

Dividing the imports by Country
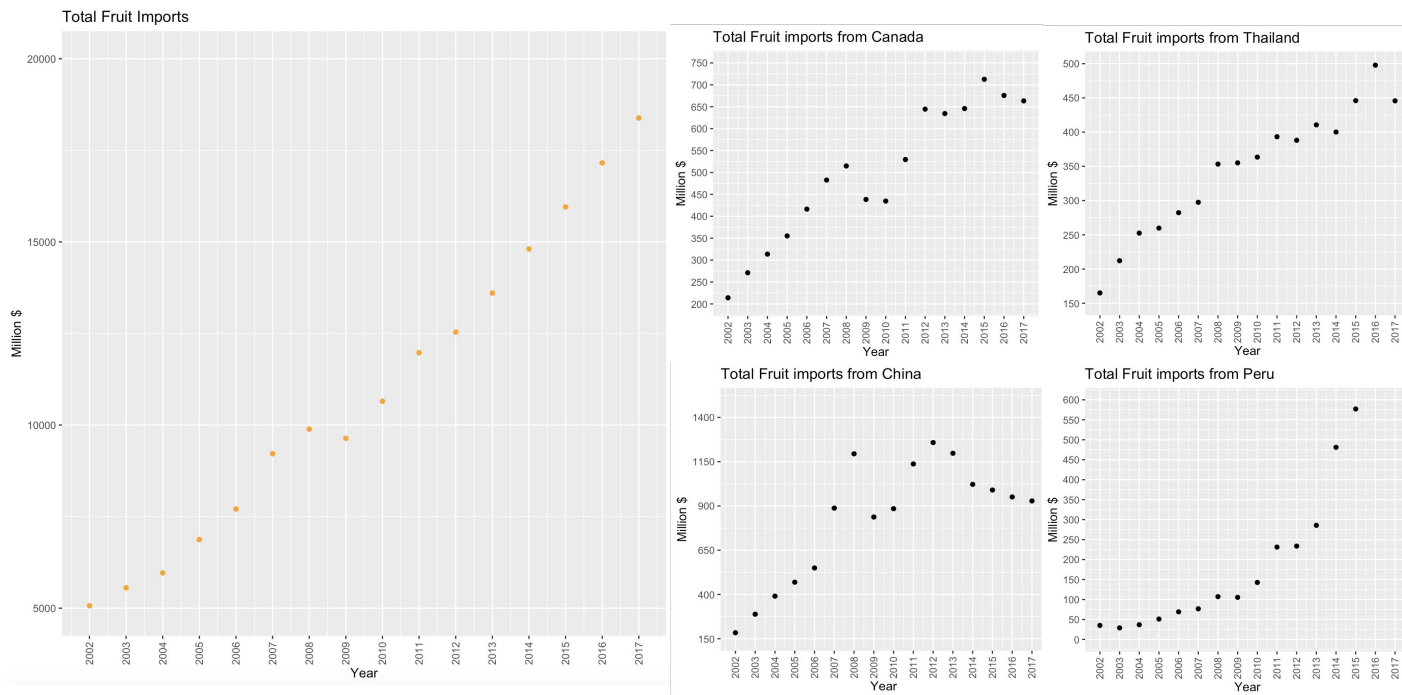
Limitations

- Our recommendation only looked at imports - many other qualitative and quantitative factors
  - Political Environment, trade wars, currency exchange
  - Customer preference - change in population or popular trend
  - Climate change and unforeseen weather patterns
  - Cost structure - profit margins and acquisition cost of capital

Conclusion

- Based on our model we believe that imports of grains will go up the most - relatively high accuracy
- Only one variable of many to look at before making a comprehensive recommendation
- Further analysis would be to receive cost and pricing data as well as study the regions from which each food type is coming from.

Questions