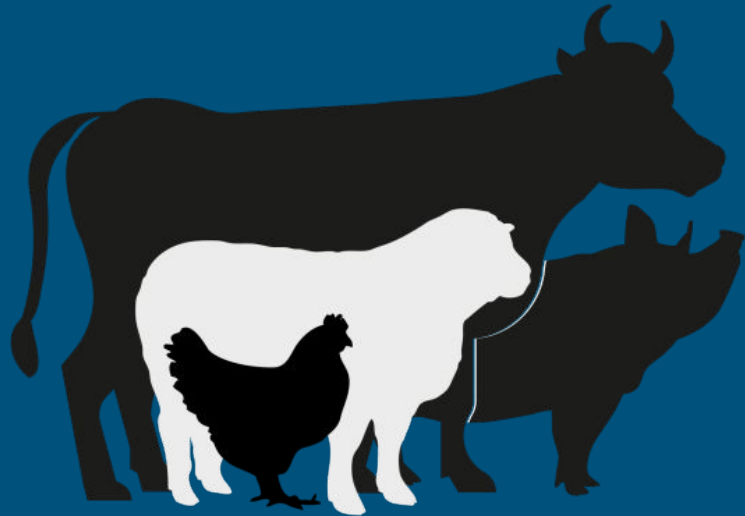


# Tastes Like...

Shifting Trends in Meat Consumption and  
its Reflection in Our Recipes

Brooke Cyphers  
Capstone DAI 2024



# Overview: What This Project Will Accomplish

## Part 1

- Look at global meat trends and determine the 'best' meat protein to incorporate in a meal planning recipe generator.
- I am determining 'best' in terms of:
  - Price affordability
  - Prevalence in the marketplace
  - Stability in the market

## Part 2

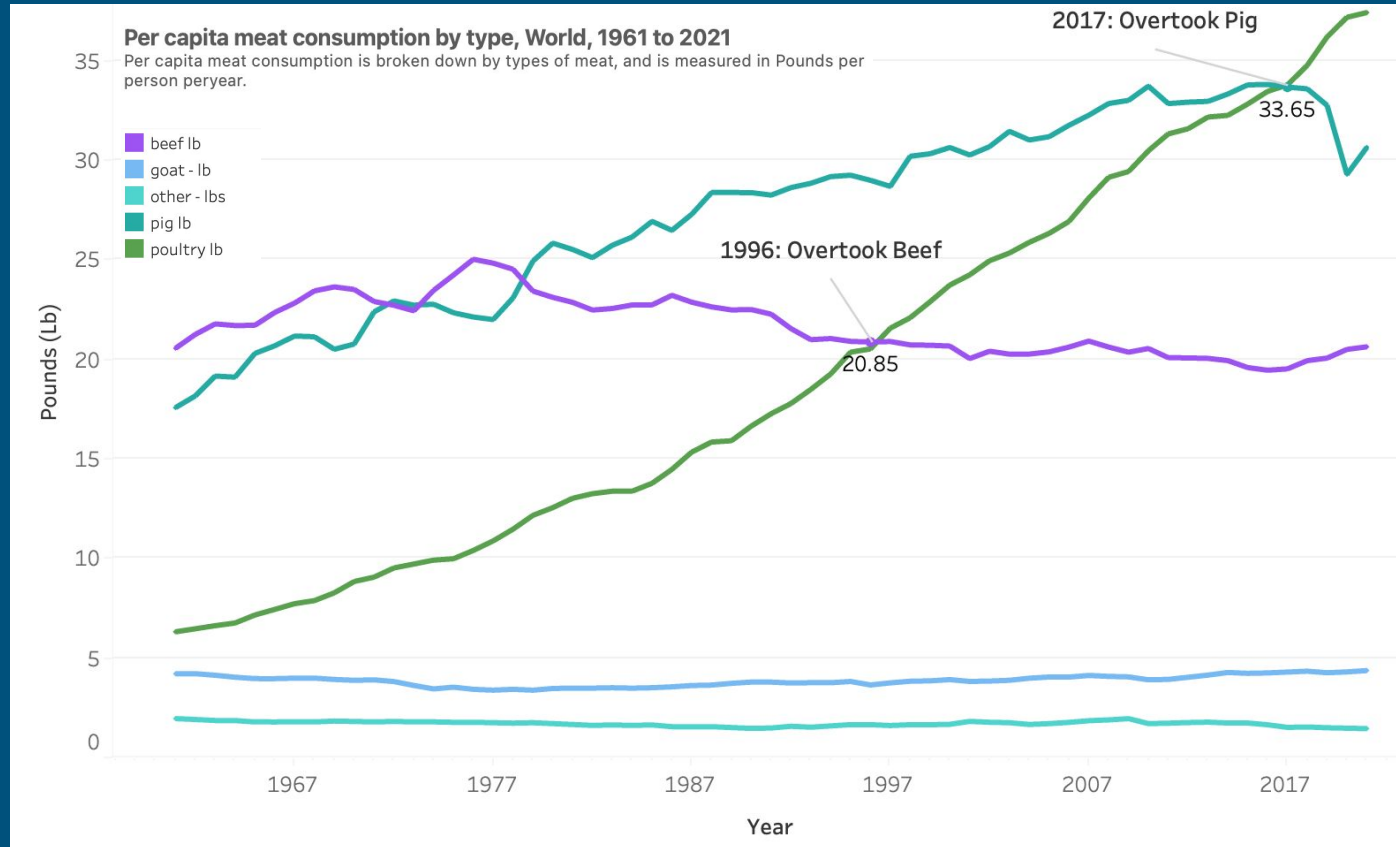
- Use the meat protein found in part 1 to create a **recipe generator** that will assist in meal prep.
- By choosing a price conscious meat protein the generator will assist in keeping overall recipe prices lower, help to plan meals for a week and reduce the amount of food waste by buying in bulk.
- I will be using a sample of 500,000 recipes from Foods.com to create the final product.

# World Quick Look: What is the World Eating?

Systemic missing/  
under-reported data from  
developing/  
underdeveloped  
countries.

Emphasis on local  
farming and individual  
production.

1976 tipping point for  
beef.

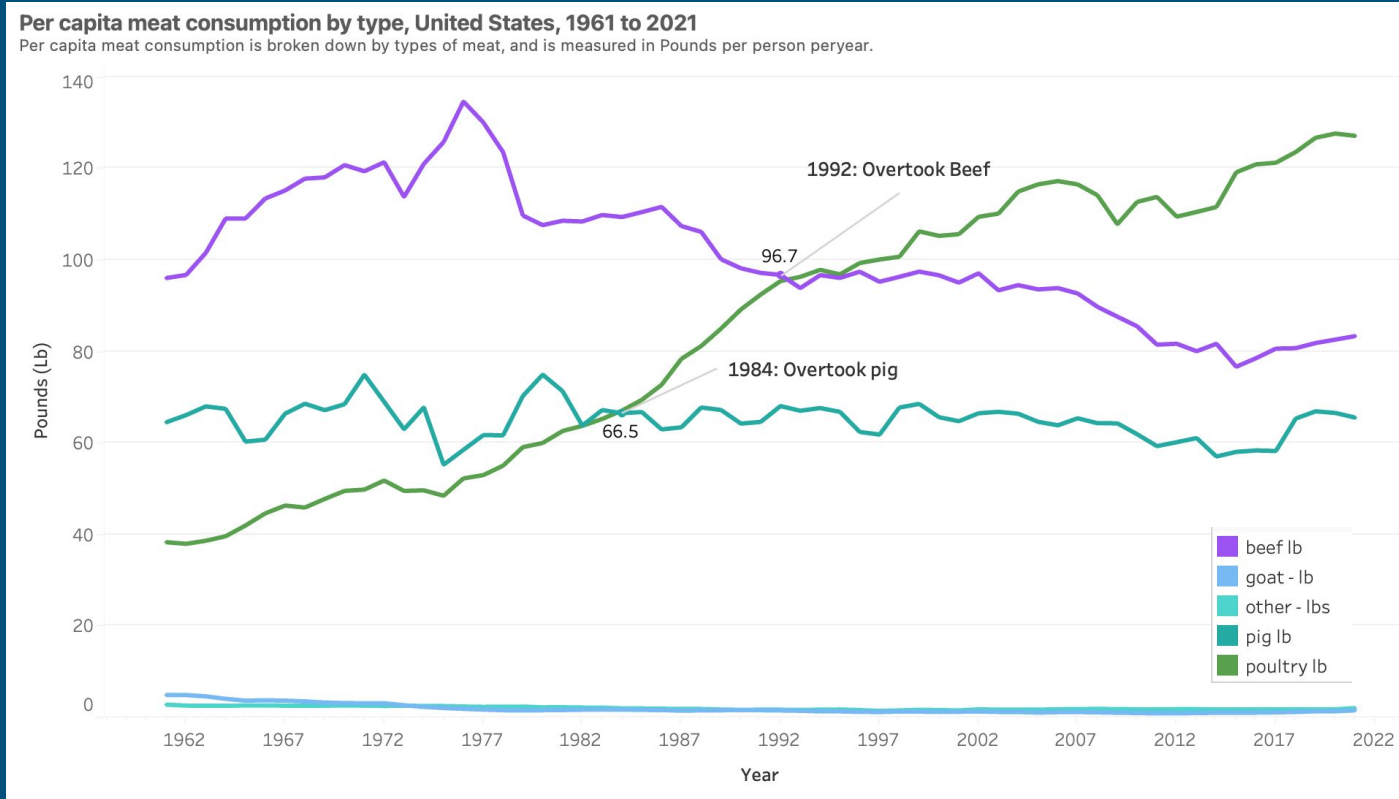


# Meat Consumption: What are Americans Eating?

49% of Americans eat chicken multiple times a week

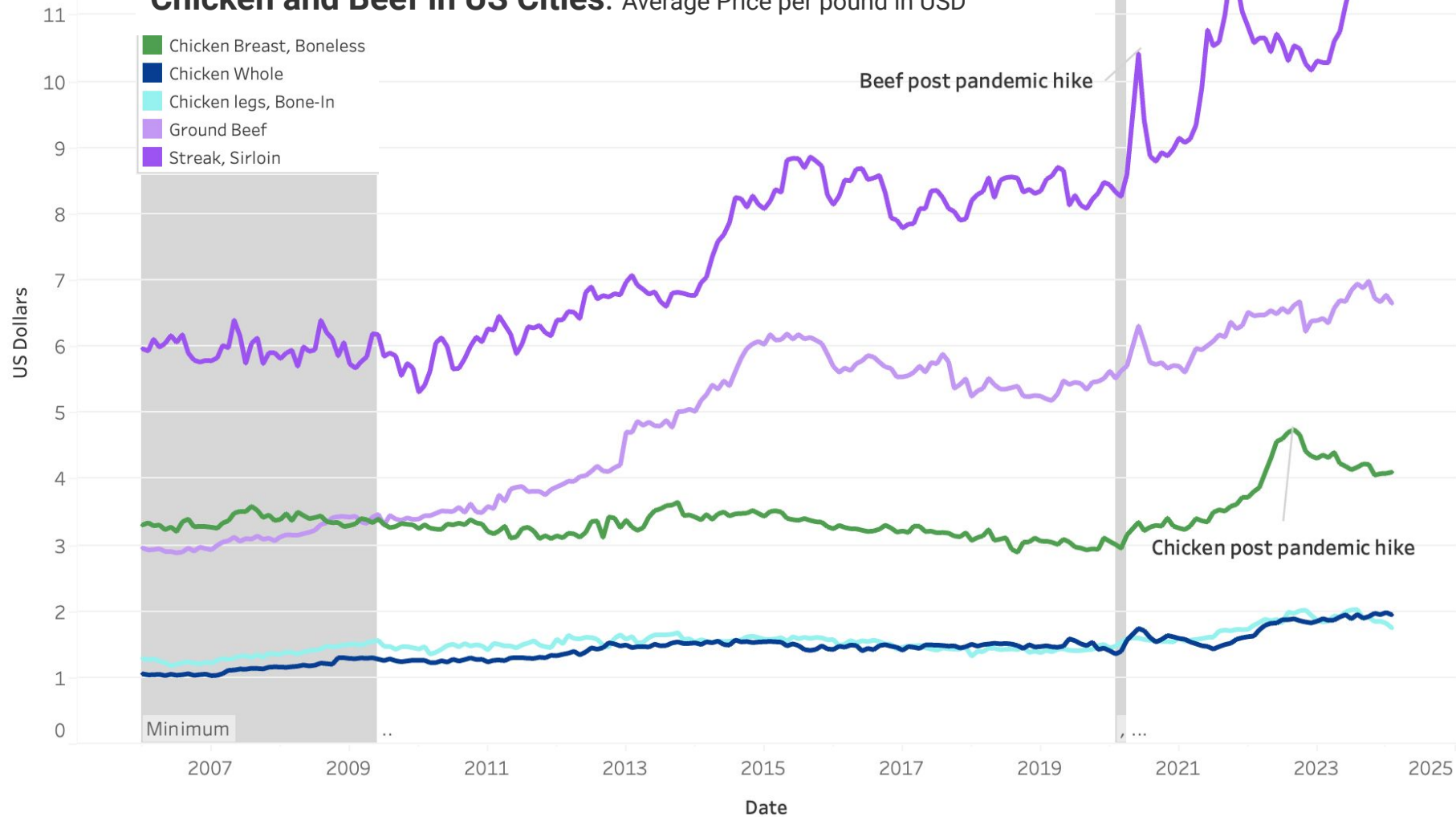
Per capita meat consumption - 100.6 lb (includes lunch meat and cold cuts) - highest it's ever been

On average, eat twice as much meat as rest of world



\*Removed goat/other meats to look at top 3 consumed meats. Others combined were less than 10%. Fish not included in the dataset.

# Chicken and Beef in US Cities: Average Price per pound in USD

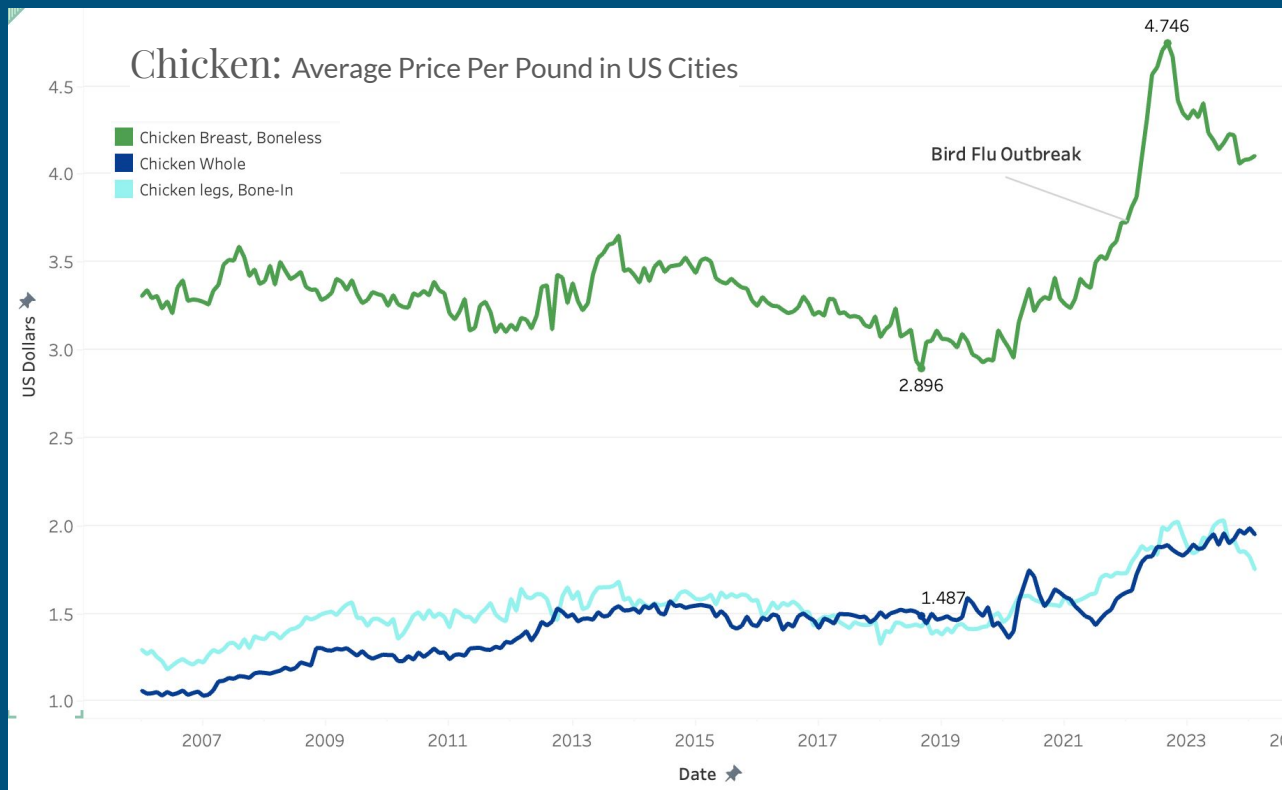


# Drivers of Chicken Price Increases

2021- 52.7 million birds killed in Bird Flu outbreak in US.

Since the pandemic: chicken breast - 72% price increase

2023 Oct. - Tyson announces closures of six U.S. chicken plans. Reduction in stock = increased prices



*Tastes like chicken*



# Anatomy of a Rising Star

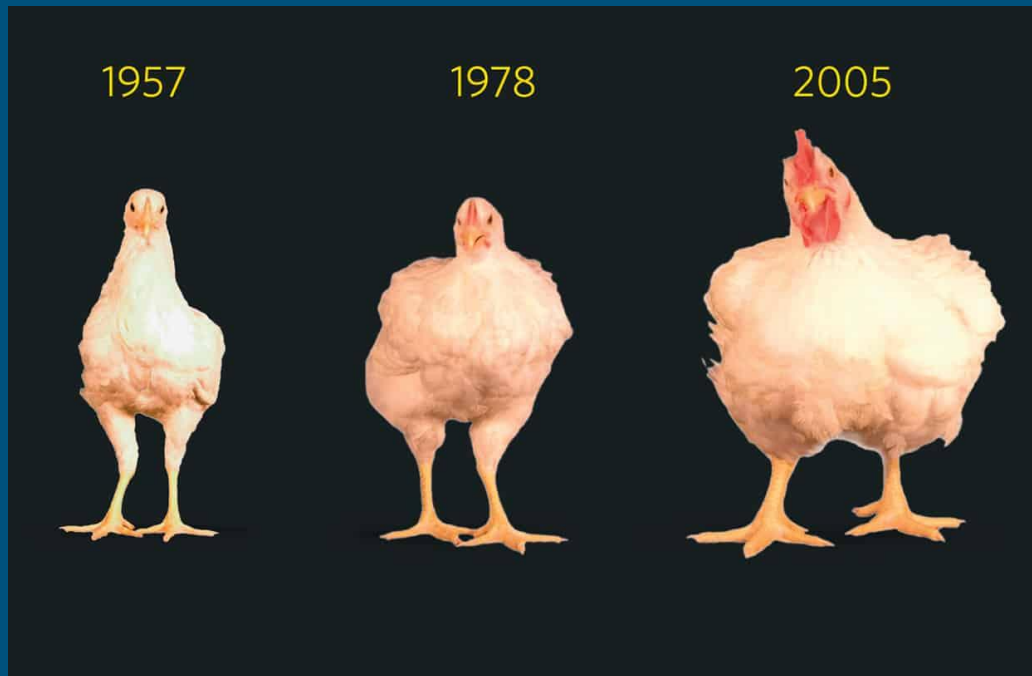
The 1957 breed averaged 905 grams.

The 1978 breed averaged 1,808 grams.

The modern breed (2005) averaged 4,202 grams. 4x increase in body size in just a few short decades.

Breast size increased by 80%

Efficiency of feed conversion to muscle

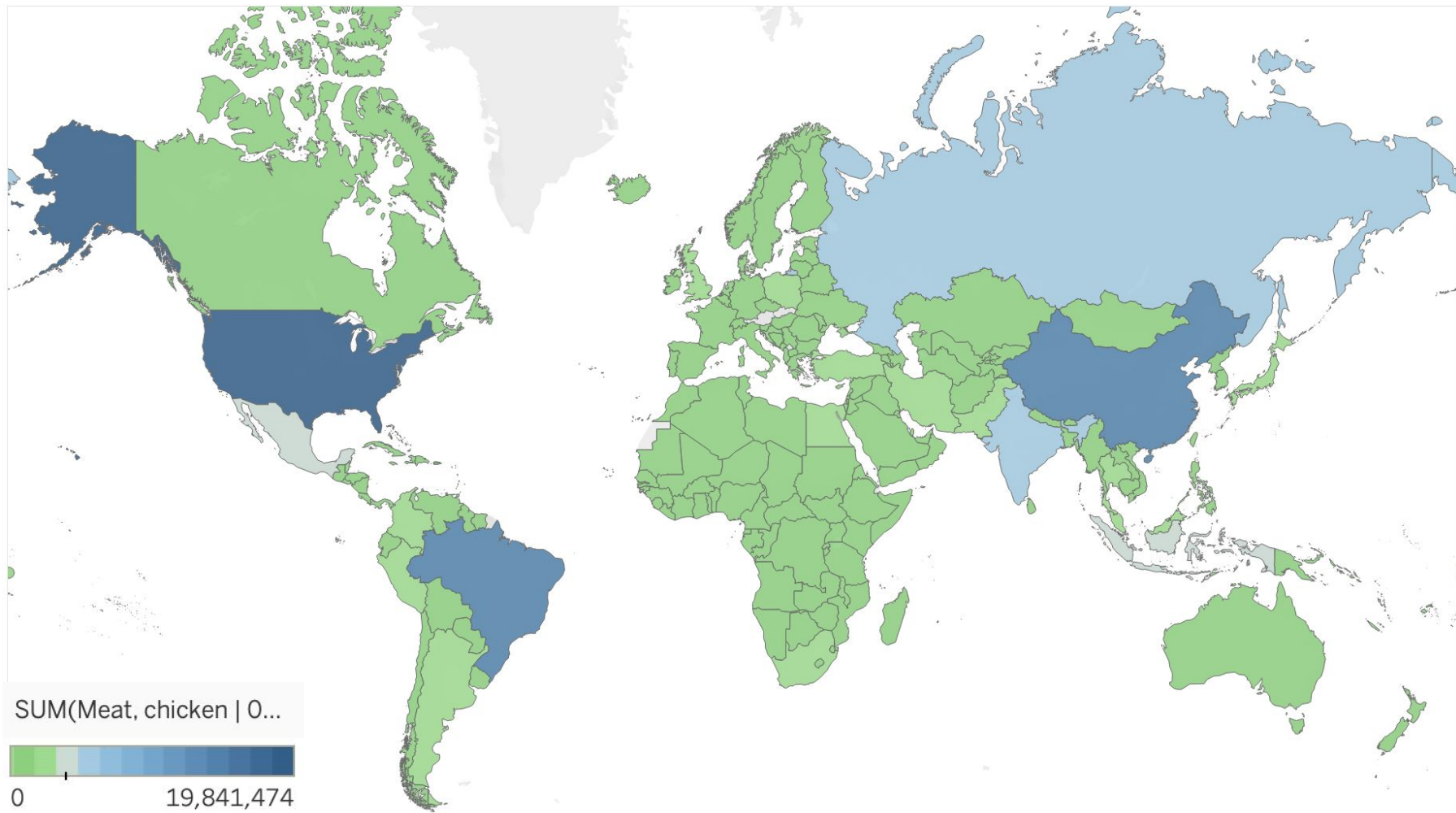


- \* For this dive into chicken consumption I have set aside issues of animal treatment and the effects of mass commercial farming.
- \* Boiler and meat chickens only, not looking at egg production.



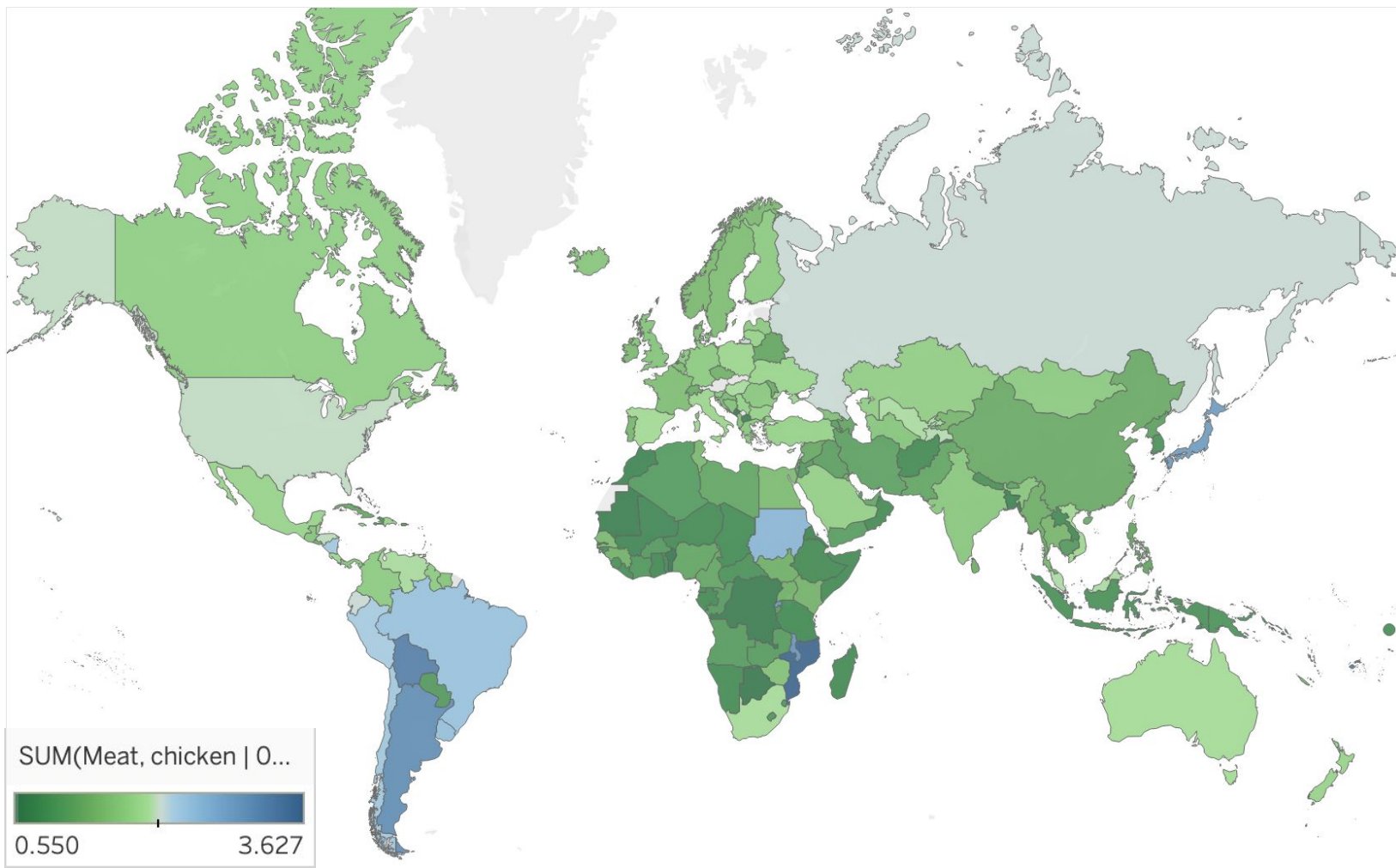
# Chicken meat production, 2022

Chicken meat production is measured in tonnes per year.



# Chicken meat yield per animal, 2022

Average meat yield per carcass, measured in kilograms per chicken.



# Project Next Steps: Part 2



## Continued Data Cleaning

Ask me about plain text cleaning!

Standardize timestamp that will work in a visualization tool.

How to link object lists to multiple columns.

Focus on RecipeIngredientList.

Move visuals out of Pandas.

## Analysis of Recipes

Does main protein distribution follow world meat consumption trends?

Can this be shown though recipe country keyword?

Amount of meat vs protein value in recipe?

Does the protein type (whole, breasts, leg, thigh) effect overall cook time?

## Recipe Generator

Input schema

- Overall duration group
- Main protein
- Main vegetable
- Calorie range
- Protein range

Output schema

- Recipe name
- Ingredient list
- Directions with measures

Tableau Dashboard

# Retrospective



## Tools Used

Python - Exploration, cleaning and initial visualizations

Excel - Exploration, condensing data to import to Python

Jupyter Notebooks - Python housing

Tableau - Visualizations - Will need a new tool for Part 2 to keep up with size of data

API - Data gathering

## Limitations/ Assumptions

Chicken Commodity Analysis

- Only looks at commercial poultry, not using small operations under 5,000 head.
- Systemic missing/ underreported data from developing countries.
- Differentiating between fresh and frozen good challenging.
- Wanted disposable income info, only found chained dollars that were not useful.

## Limitations/ Assumptions

Recipe Data

- Normalization took way longer than expected.
- Data types more suited for R.
- Needed multiple additional datasets to use for ingredient categorization.
- Data from self reported sources all use different characters in text.
- Multiple languages make capturing all spellings/ variations challenging.
- Keywords subjective.



# Thank you



Questions?



# Citations

- U.S. Bureau of Labor Statistics, Average Price: Ground Beef, 100% Beef (Cost per Pound/453.6 Grams) in U.S. City Average [APU0000703112], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/APU0000703112>, April 4, 2024.
- U.S. Bureau of Labor Statistics, Average Price: Chicken Breast, Boneless (Cost per Pound/453.6 Grams) in U.S. City Average [APU0000FF1101], retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org/series/APU0000FF1101>, March 27, 2024.
- <https://fred.stlouisfed.org/graph/?id=APU0000706211,APU0000FF1101,APU0000706212,APU0000706111>,
- <https://fred.stlouisfed.org/release/tables?rid=249&eid=259593#snid=259616>
- [https://www.fao.org/statistics/resources/en?indexCatalogue=search-index-statistics&wordsMode=AllWords&fallbacklang=en&tags=fbd69aa3-f45b-4bf3-aa6b-a57bc22659d1&searchQuery=\\*>\\*](https://www.fao.org/statistics/resources/en?indexCatalogue=search-index-statistics&wordsMode=AllWords&fallbacklang=en&tags=fbd69aa3-f45b-4bf3-aa6b-a57bc22659d1&searchQuery=*>*)
- <https://www.sentienceinstitute.org/us-factory-farming-estimates>
- <https://fred.stlouisfed.org/release/tables?rid=249&eid=259593#snid=25961>
- For income - will use median, highly skewed data for census information
- [https://www.economist.com/international/2019/01/19/how-chicken-became-the-rich-worlds-most-popular-meat?utm\\_medium=cpc.adword.pd&utm\\_source=google&ppccampaignID=17210591673&ppcadID=&utm\\_campaign=a.22brand\\_pmax&utm\\_content=conversion.direct-response.anonymous&gad\\_source=1&qclid=Cj0KCQjwztOwBhD7ARIsAPDKnkASxJ7p5cc\\_WV2IIFZtE6ry-uA4z3aX6XuT7kPWh0XBD11MQHs6DcYaAkAyEALw\\_wcB&qclsrc=aw.ds](https://www.economist.com/international/2019/01/19/how-chicken-became-the-rich-worlds-most-popular-meat?utm_medium=cpc.adword.pd&utm_source=google&ppccampaignID=17210591673&ppcadID=&utm_campaign=a.22brand_pmax&utm_content=conversion.direct-response.anonymous&gad_source=1&qclid=Cj0KCQjwztOwBhD7ARIsAPDKnkASxJ7p5cc_WV2IIFZtE6ry-uA4z3aX6XuT7kPWh0XBD11MQHs6DcYaAkAyEALw_wcB&qclsrc=aw.ds)
- <https://www.worldstopexports.com/chicken-exports-by-country/>
- <https://www.kaggle.com/datasets/kaggle/recipe-ingredients-dataset>