



Meat production and consumption in world

Di Cui

Master of Business Analytics

Guanru Chen

Master of Business Analytics

Yunzhi Chen

Master of Business Analytics

Report for
Our World in Data

25 May 2022

TGIF
Di Cui &
Guanru Chen &
Yunzhi Chen

☎ (03) 9905 2478
✉ questions@company.com

ABN: 12 377 614 630

1 Data set introduction

Feeding the world in a sustainable way is one of our most pressing challenges in the coming decades. Meat plays a pivotal role in this.

Meat is an important source of nutrition for many people around the world. Global demand for meat is growing: over the past 50 years, meat production has more than tripled. The world now produces more than 340 million tonnes each year.

But the production of meat has large environmental impacts – increasing greenhouse gas emissions, agricultural land and freshwater use. One of the world's most pressing challenges is to produce and consume meat, dairy and other protein products in a way that reduces its environmental impacts.

The data set was obtained from the “Our World in Data” data base and contains the following variables regarding to meat production of the world:

- Entity
- Year
- Amount of production: Measure in tons.
- Livestock types: including beef and buffalo, pigmeat, poultry, sheep and goat, and other meat types such as horse or camel et cetera.
- Meat type consumption (kg/capita/year).

2 Research questions

3 Exploratory data analysis

Global meat production – Di Cui

Analysis

Q1: How did global meat production develop by continents?

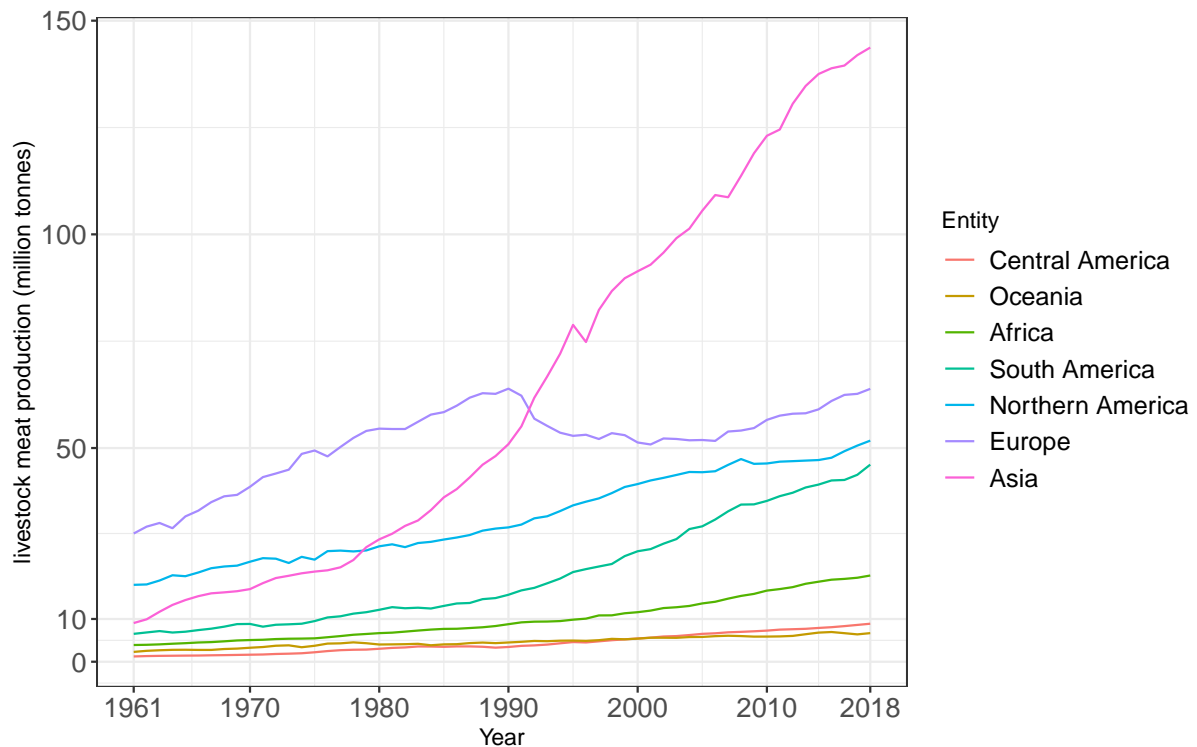


Figure 1: Global meat production from 1961 to 2018

From Figure 1, we can see all continents show an uptrend. In particular, production in Asia has increased from around 10 million tonnes to around 150 million tonnes. And in 1992, Asia produced more than Europe and became the largest meat producer.

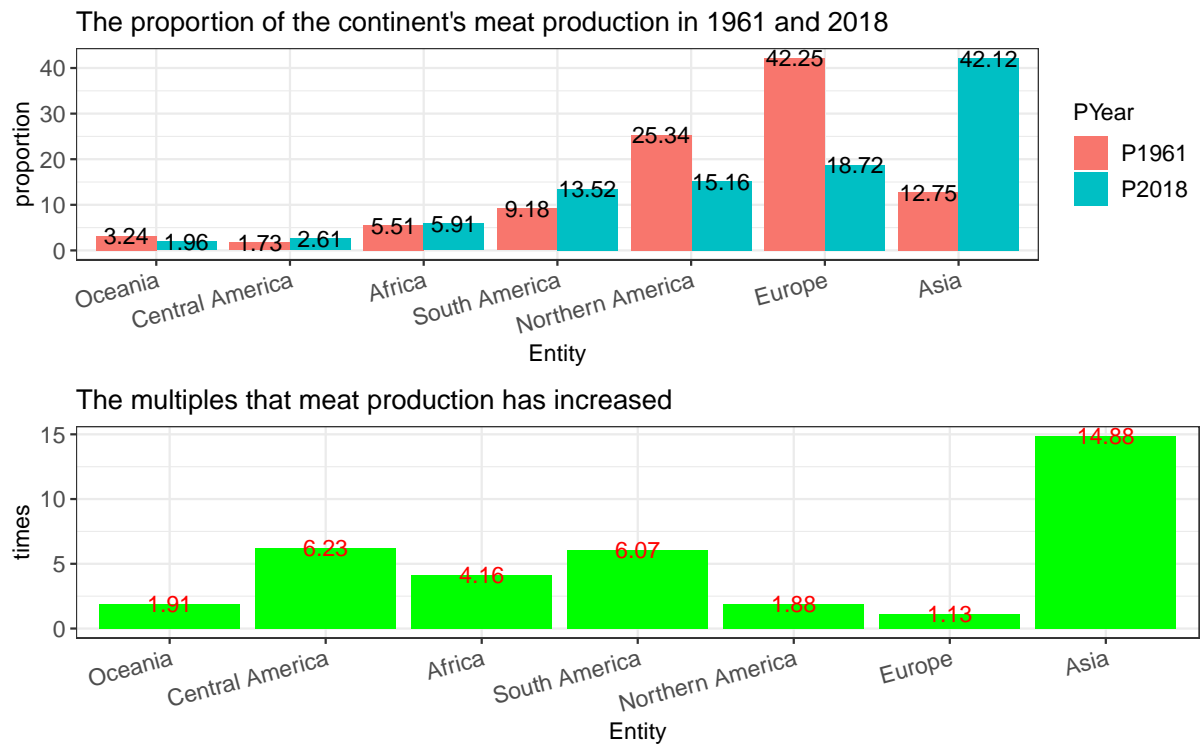


Figure 2: Comparision of meat production between 1961 and 2018

See Figure2. In 2018, meat production in Asia has increased around 15 times, accounting for around 43% of total production, while the proportion of Europe and Northern America has decreased, although their production has increased.

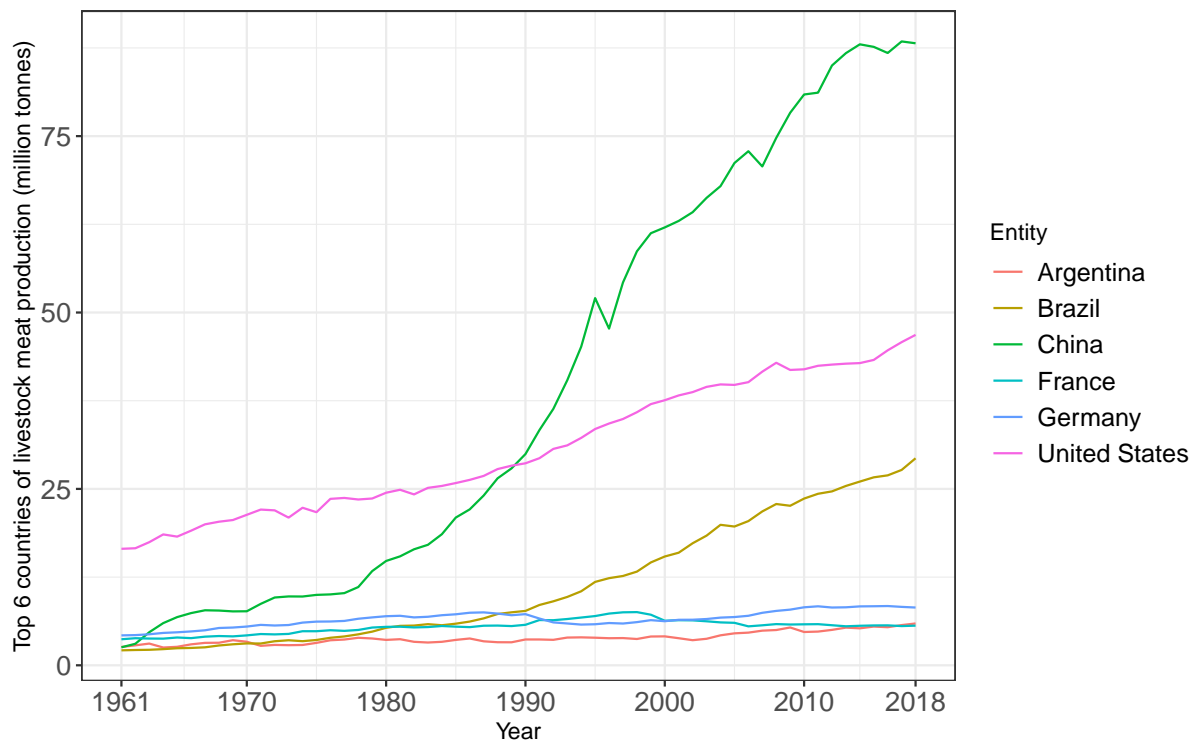
Q2: How did the meat production develop in some countries which contributed greatly?

Figure 3: *Top six countries' meat production from 1961 to 2018*

From Figure 3, it is obvious that China meat production has increased sharply. And China surpassed the United States in 1990, and has been the largest meat production country in the world since 1990.

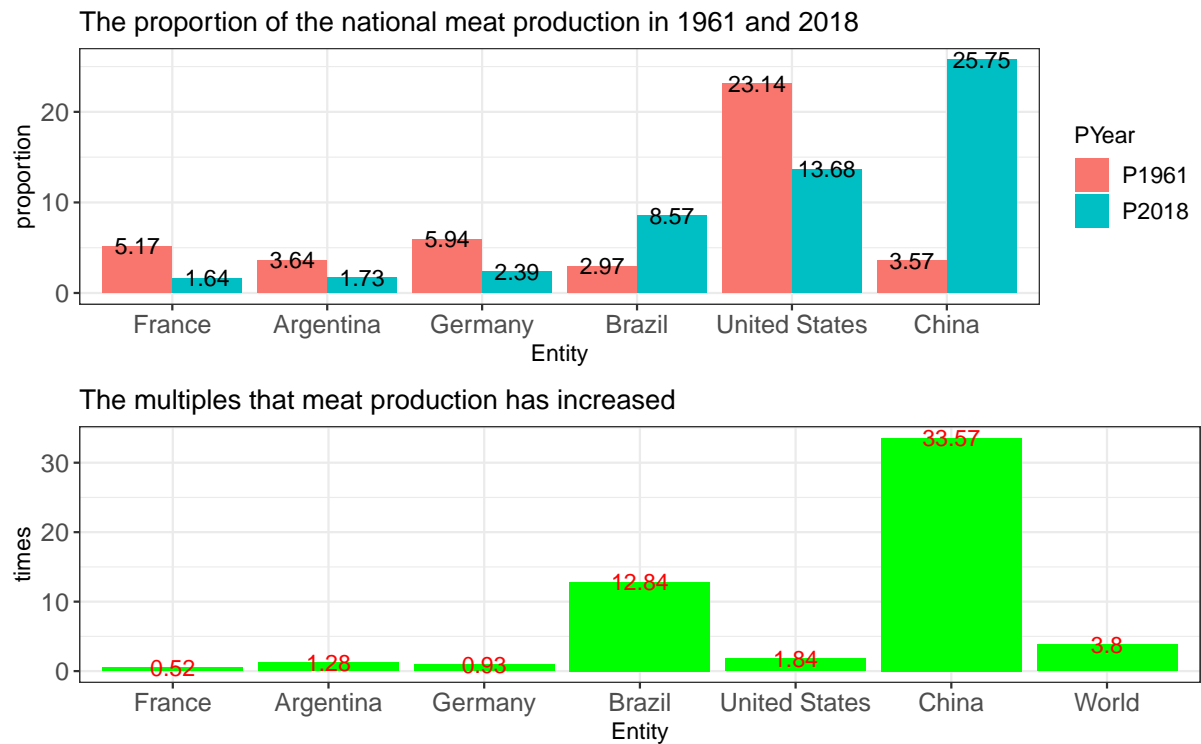


Figure 4: Comparision of meat production between 1961 and 2018

See Figure4. In 2018, The world's meat production has increased around quadrupled. And China has increased about 34 times compared to 1961, accounting for about 26% of global meat production. And the meat production in United States accounted for about 14%, although the production only has doubled.

Meat production by livestock type– Guan Ru Chen

Research Question

1. What's the production distribution of different livestock types across the world?
2. Which countries are main production country for different types of meat, such as: Beef and buffalo, pig and poultry?

Analysis

Q1: What's the production distribution of different livestock types across the world?

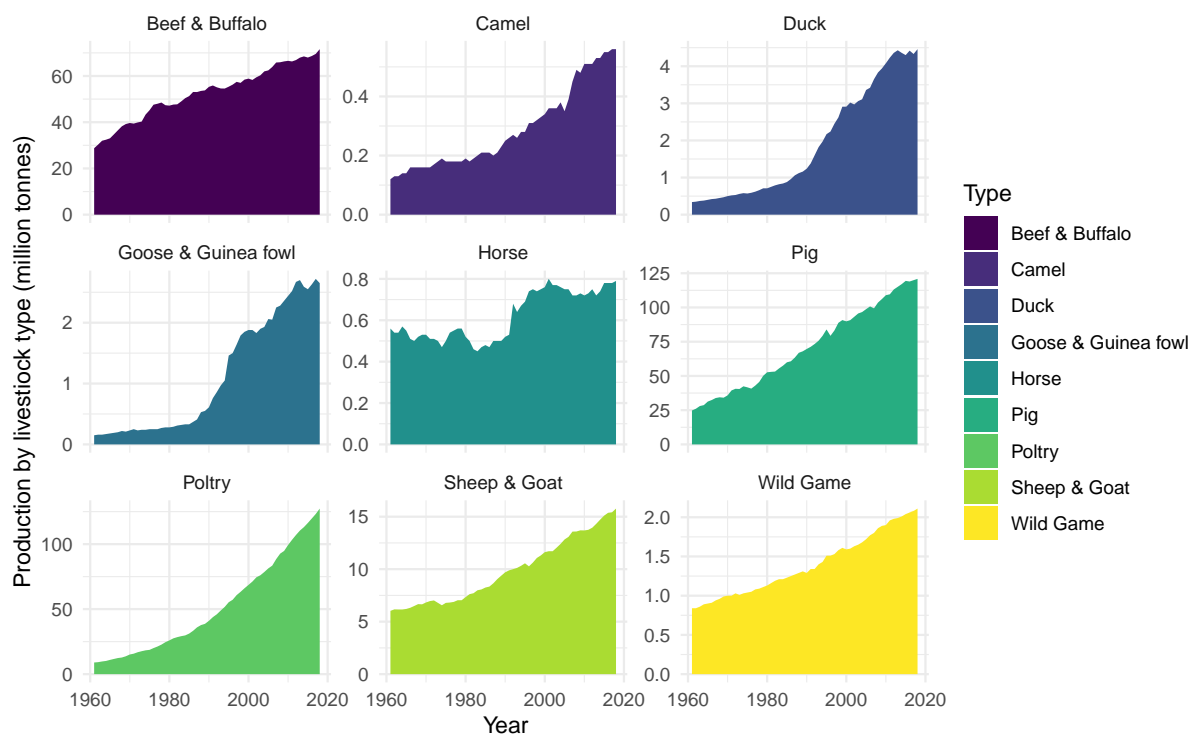


Figure 5: Global meat production by livestock type, 1961 to 2018

In figure 5, we see that the dominant livestock types are poultry, cattle (which includes beef and buffalo meat), pig, and sheep & goat to a lesser extent at global level.

Although production of all major meat types have been increasing in absolute terms, in relative terms the share of global meat types have changed significantly over the last 50 years. In 1961, poultry meat accounted for small portion; by 2013 its share has tripled. In comparison, beef and buffalo meat as a share of total meat production has nearly halved. And the Pigmeat's share has remained more constant.

Q2: Which countries are main production country for different types of meat, such as: Beef and buffalo, pig and poultry?

Table 1: Beef and buffalo (cattle) meat production (million tonnes), 1961-2018

Entity	Production
World	3048.30
Americas	1355.77
Europe	808.42
Northern America	687.74
United States	627.73
South America	568.55
Asia	527.12
European Union	494.53
Eastern Europe	340.15
Low Income Food Deficit Countries	296.90
Net Food Importing Developing Countries	291.25
Brazil	289.01
Europe, Western	243.83
Africa	227.54
Southern Asia	195.48
USSR	192.97
Eastern Asia	192.05
Argentina	155.12
China	151.85
Least Developed Countries	140.57

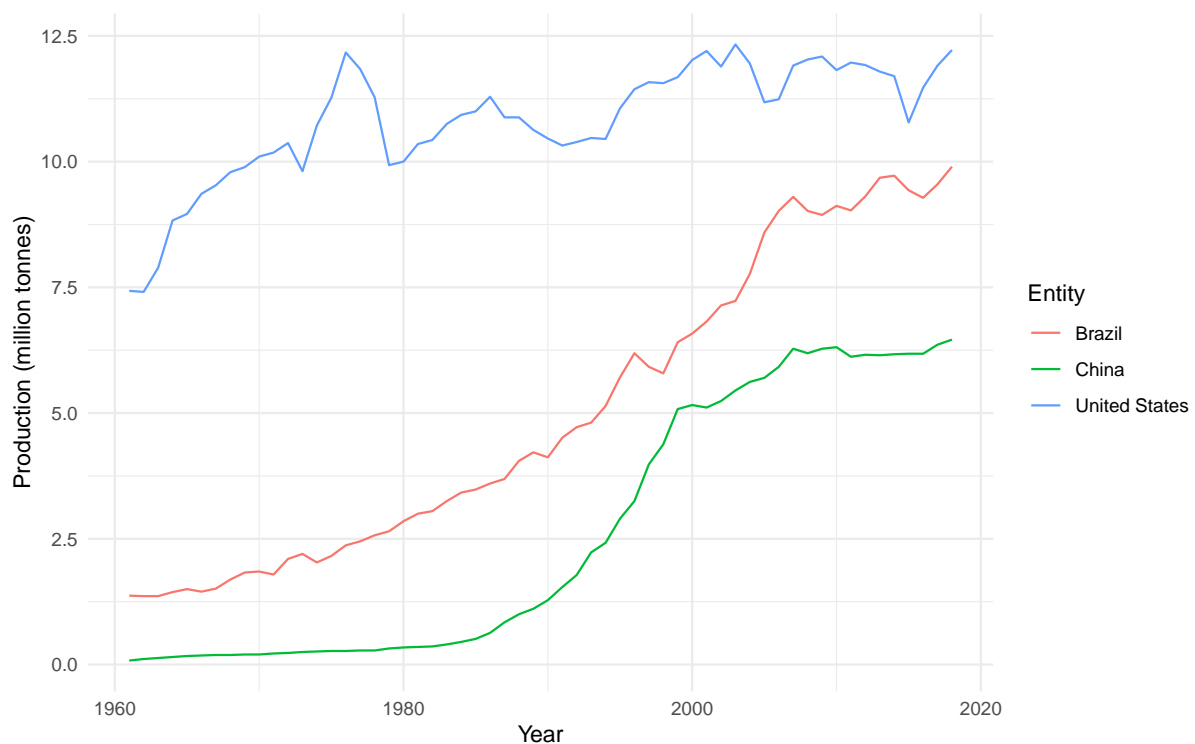


Table 2: Poultry meat production (million tonnes), 1961-2018

Entity	Production
World	2971.53
Americas	1247.97
Asia	925.59
Northern America	714.31
United States	669.00
Europe	628.97
Eastern Asia	514.42
European Union	476.77
China	428.55
South America	420.22
Brazil	264.62
Eastern Europe	222.83
Net Food Importing Developing Countries	207.48
South Eastern Asia	191.20
Europe, Western	183.20
Southern Europe	135.95
Africa	134.62
Southern Asia	121.39
Low Income Food Deficit Countries	119.84
Western Asia	95.01

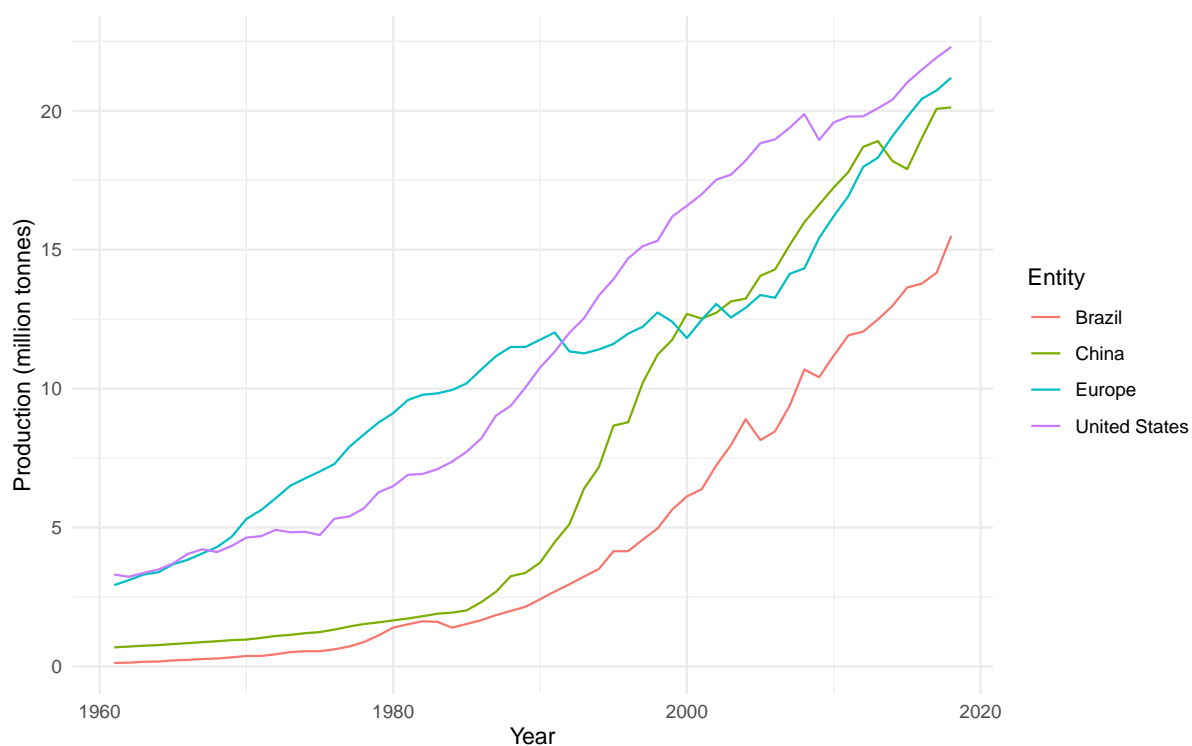
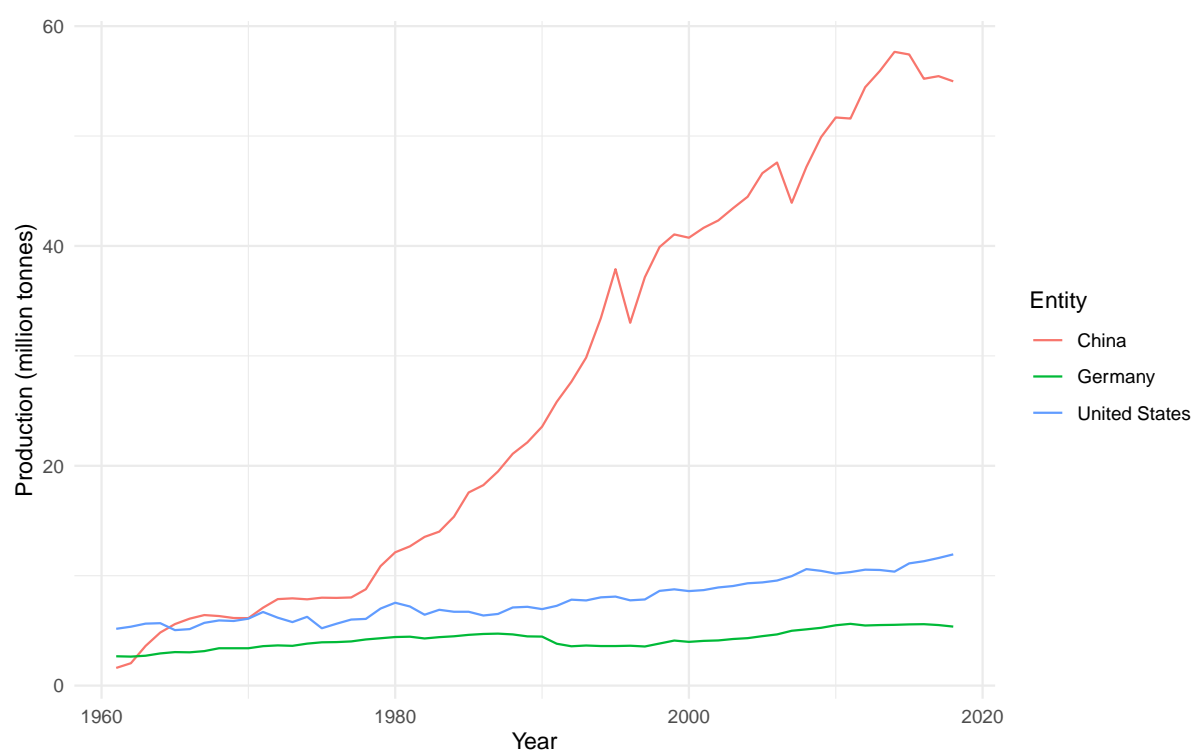


Table 3: *Pig meat production (million tonnes), 1961-2018*

Entity	Production
World	4097.38
Asia	1898.60
Eastern Asia	1669.83
China	1560.96
Europe	1381.51
European Union	1058.78
Americas	757.20
Northern America	523.61
Europe, Western	506.08
Eastern Europe	469.05
United States	450.61
Germany	243.52
Southern Europe	237.61
South Eastern Asia	201.43
Northern Europe	168.77
South America	161.54
USSR	158.90
Low Income Food Deficit Countries	122.94
Spain	112.06
France	107.51



In the table 1, we see the global production of cattle (beef and buffalo) meat. From the country's perspective, The United States is the world's largest beef and buffalo meat producer. Other major producers are Brazil and China.

In the table 2, we can see the production of poultry, like cattle production, the United States is still the world's largest producer. China and Brazil are also large poultry producers. Collectively, Europe is also a major poultry producer, just below the United States.

But for pigmeat production 3, China dominates global output, producing just short of half of total pigmeat. The other major producers include the United States, Germany.

Per capita meat consumption – Yunzhi Chen

Analysis

Q1: Which countries eat the most meat in the last 20 years?

As can be seen from the Table 4 below, the top six countries with the highest average meat consumption mean in the world over the 20-year period from 1997 to 2017 are the United States, Australia, New Zealand, Spain, French Polynesia and Bahamas. The highest per capita meat consumption mean of the United States reached about 121.2 kg/capita/year. It can be concluded that countries with high income also consume more meat. Developed countries account for a large share of the six countries with the highest average meat consumption over years.

Table 4: *Top 6 countries with the largest mean of meat consumption over years*

Country	Mean_consumption_kg_capita_yr
United States	121.19
Australia	114.96
New Zealand	105.19
Spain	105.14
French Polynesia	99.86
Bahamas	98.57

In terms of changing trends, figure 6 shows the meat consumption per person in these countries over the last 20 years have fluctuated considerably, with the exception of Australia and the United States, where consumption has increased, while all other countries have shown a decreasing trend, but the total value is still much higher than the world per capita meat consumption.

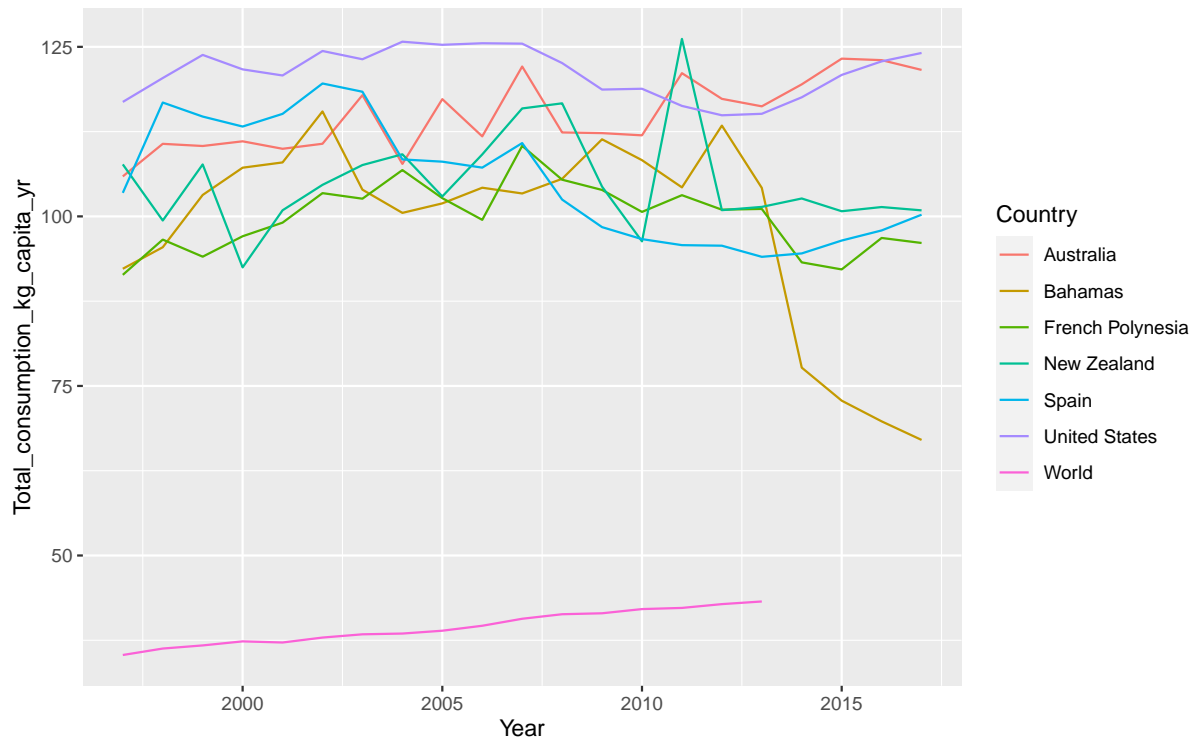


Figure 6: Consumption trend of top 6 countries

Q2: What types of meat do people eat?

From figure 7, it illustrates that as a global average, pork has the highest per capita consumption of meat commodities; in 2013, per capita pork consumption was about 16 kg; followed by 15 kg of poultry; 9 kg of beef/buffalo meat; 2 kg of lamb and goat; and only a small percentage of other meats.

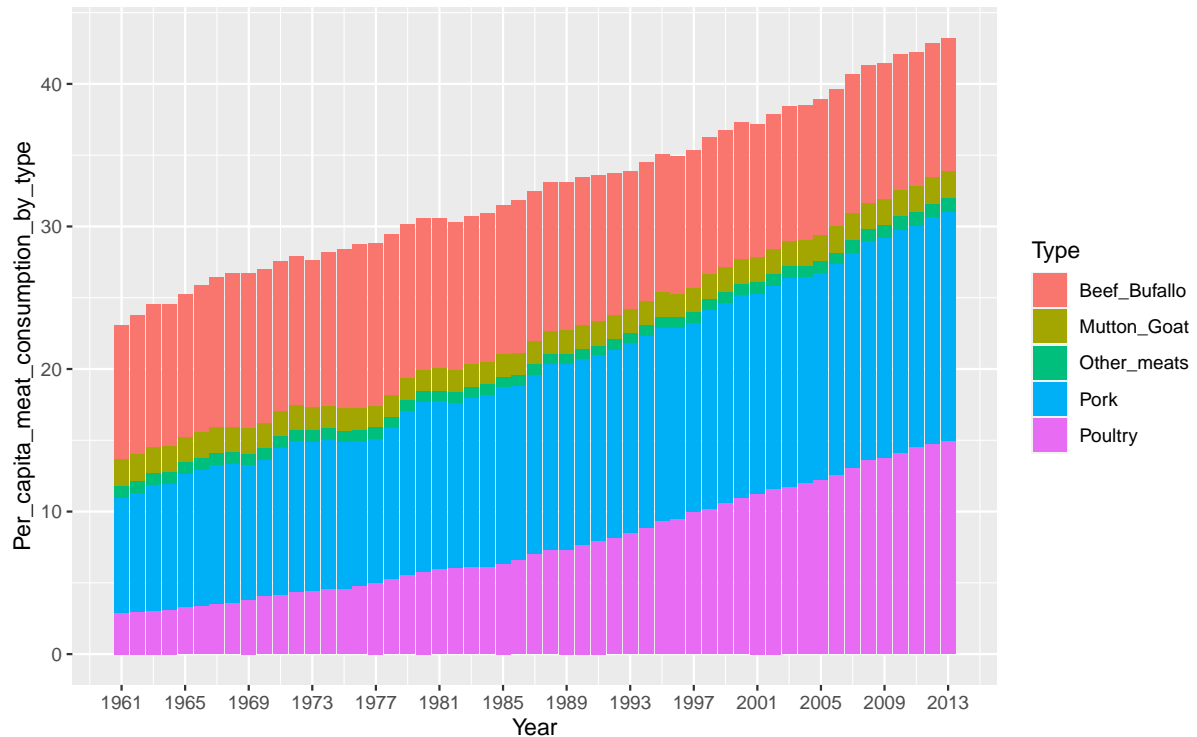


Figure 7: Meat type changes over time

4 Conclusion

- In 2018, production was around 340 million tonnes. And Asia and China have contributed greatly to global meat production.
- The average person in the world consumed around 43 kilograms of meat in 2014. This ranges from over 100kg in the US and Australia to only 5kg in India.
- The amount of meat produced for a given animal varies significantly across the world based on production systems.
- Richer countries tend to consume more meat per person. Developed countries account for a large share of the six countries with the highest average meat consumption in the last 20 years.
- Although there is a lot of fluctuation, the amount of meat consumed per capita is much larger than the world average.
- At the world level, per capita consumption of pork is the highest among meat commodities over years.

Citation

The data set is cited from Ritchie and Roser (2017).

Analysis of the data is done using the following packages:

bookdown Xie (2022), Xie (2016),

tidyverse Wickham et al. (2019),

readr Wickham, Hester, and Bryan (2022),

viridis Garnier et al. (2021),

gridExtra Auguie (2017)

References

Auguie, B (2017). *gridExtra: Miscellaneous Functions for "Grid" Graphics*. R package version 2.3.
<https://CRAN.R-project.org/package=gridExtra>.

- Garnier, Simon, Ross, Noam, Rudis, Robert, Camargo, A Pedro, Sciaini, Marco, Scherer, and Cedric (2021). *viridis - Colorblind-Friendly Color Maps for R*. R package version 0.6.2. <https://sjmgarnier.github.io/viridis/>.
- Ritchie, H and M Roser (2017). Meat and Dairy Production. *Our World in Data*. <https://ourworldindata.org/meat-production>.
- Wickham, H, M Averick, J Bryan, W Chang, LD McGowan, R François, G Golemund, A Hayes, L Henry, J Hester, M Kuhn, TL Pedersen, E Miller, SM Bache, K Müller, J Ooms, D Robinson, DP Seidel, V Spinu, K Takahashi, D Vaughan, C Wilke, K Woo, and H Yutani (2019). Welcome to the tidyverse. *Journal of Open Source Software* 4(43), 1686.
- Wickham, H, J Hester, and J Bryan (2022). *readr: Read Rectangular Text Data*. R package version 2.1.2. <https://CRAN.R-project.org/package=readr>.
- Xie, Y (2016). *bookdown: Authoring Books and Technical Documents with R Markdown*. ISBN 978-1138700109. Boca Raton, Florida: Chapman and Hall/CRC. <https://bookdown.org/yihui/bookdown>.
- Xie, Y (2022). *bookdown: Authoring Books and Technical Documents with R Markdown*. R package version 0.26. <https://github.com/rstudio/bookdown>.