

Analysis on Japan&United State

2022-05-20

Introduction

With the improvement of people's living standards, more and more people begin to pay attention to diet. As we all know, a healthy diet can help us maintain a healthy body and figure, and effectively prevent dangerous diseases such as high blood pressure and high blood lipids. In our daily diet, our calorie intake mainly comes from three major nutrients, namely protein, fat and carbohydrates. Studies have shown that the proportion of the three major nutrients in the daily diet plays a very important role in human health. On the other hand, people in different regions have different eating habits due to differences in climate and terrain. The food culture of each country is very different, Americans love sweets and bread, Japanese love seafood and small dishes. In this report, I study the differences in diet between the United States and Japan and analyze the changes in the per capita calorie intake and the intake of the three major nutrients in the United States and Japan since 1960, starting from two aspects of eating habits and time trends A comparative analysis of the eating habits and health of the two countries.

```
data <- read.csv("Data/daily-caloric-supply-derived-from-carbohydrates-protein-and-fat.csv")

mydata <- data %>% filter(Entity %in% c("United States", "Japan"))
```

```
pct_miss(mydata) #0 missingness in the UK and Iceland data
pct_miss_case(mydata)
pct_miss_var(mydata)
```

```

mydata <- mydata %>%
  mutate(total_Cal = Calories.from.animal.protein..FAO..2017..
    +Calories.from.plant.protein..FAO..2017..
    +Calories.from.fat..FAO..2017..
    +Calories.from.carbohydrates..FAO..2017..,
    Protein_Cal=Calories.from.animal.protein..FAO..2017..
    +Calories.from.plant.protein..FAO..2017..,
    `Protein(%)`=percent((
      Calories.from.animal.protein..FAO..2017..
      +Calories.from.plant.protein..FAO..2017..)/total_Cal,
      accuracy = 4),
    `Fat(%)`=percent(
      Calories.from.fat..FAO..2017../total_Cal
      ,accuracy = 4),
    `Carbohydrates(%)`=percent(
      Calories.from.carbohydrates..FAO..2017../total_Cal,
      accuracy = 4))%>%
  rename(Fat_Cal=Calories.from.fat..FAO..2017..,
    Carbohydrates_Cal=Calories.from.carbohydrates..FAO..2017..,
    Animal_Protein_Cal=Calories.from.animal.protein..FAO..2017..,
    Plant_Protein_Cal=Calories.from.plant.protein..FAO..2017..)
mydata=mydata%>%
  filter(Year<=2010)%>%
  filter(Year>=1961)

US_Data <- mydata %>% filter(Entity == "United States")

Japan_Data <- mydata %>% filter(Entity == "Japan")

mydata <- US_Data %>% rbind(Japan_Data)

mydata_long <- mydata %>%
  pivot_longer(cols=c(total_Cal,Protein_Cal, Fat_Cal,Carbohydrates_Cal ),
    names_to = "impact_variable", values_to = "measure")

```

Question1

(1)What is the difference in the proportions of total Calories and the three major nutrients (protein, fat, carbohydrate) from 1970 in the American and Japanese diets?

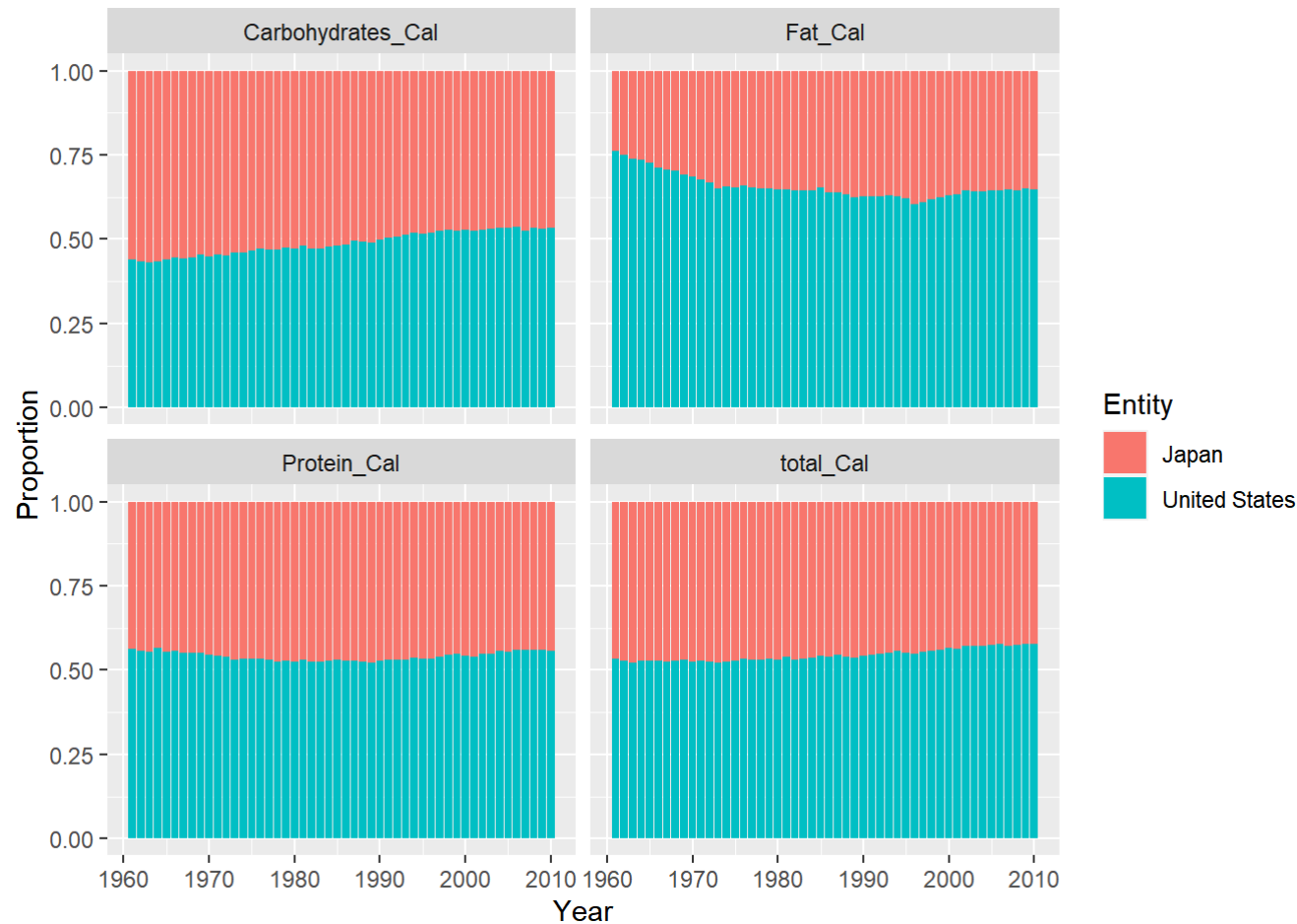
```
mydata %>%
  pivot_wider(id_cols = c(Year),
              names_from = Entity,
              values_from = c(total_Cal)) %>%
  filter(Year>=1970)%>%
  arrange(desc(Year)) %>%
  knitr::kable(caption = "Proportions of the Nutrients Comparision")
```

Proportions of the Nutrients Comparision

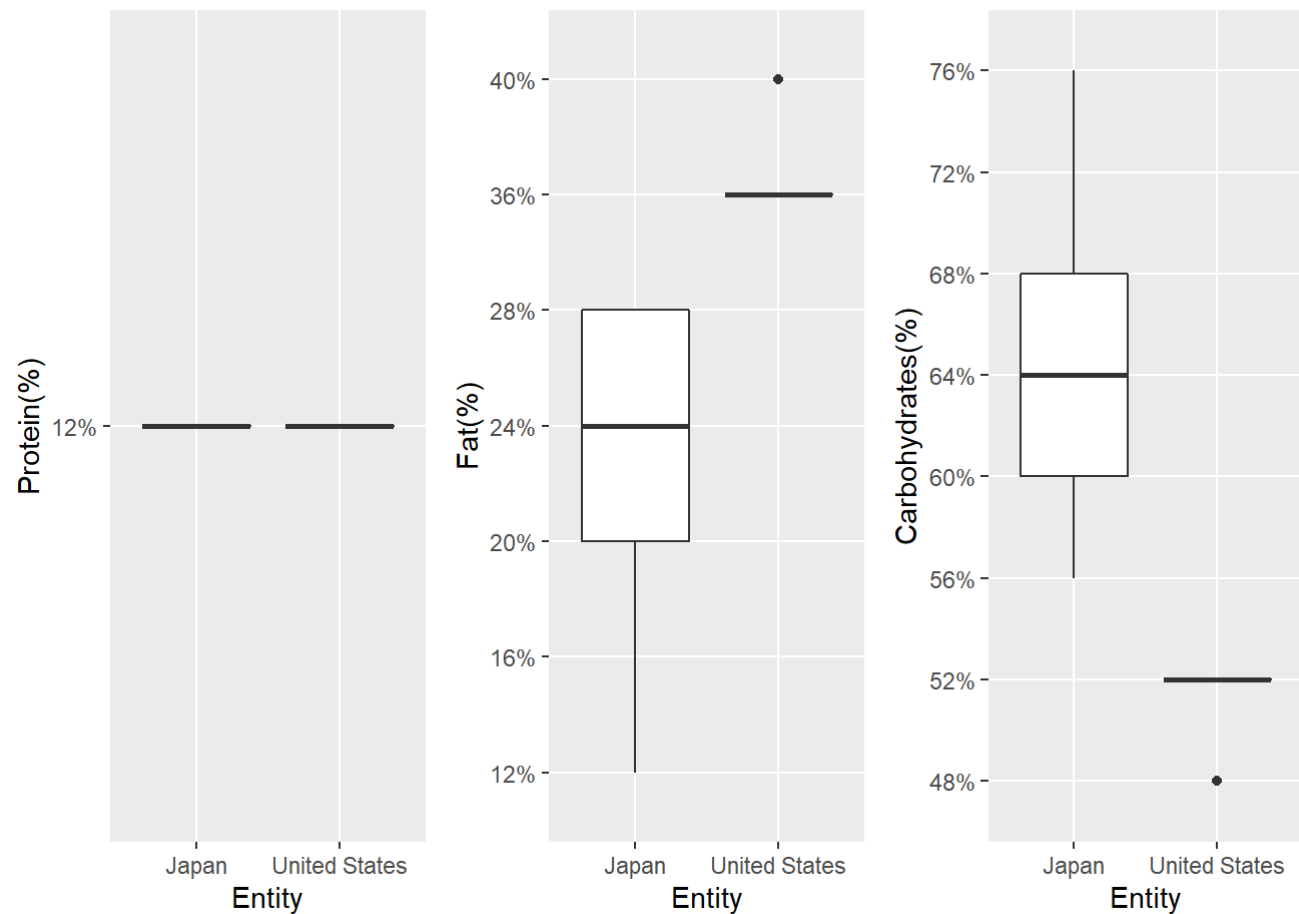
Year	United States	Japan
2010	3650	2685
2009	3645	2675
2008	3700	2734
2007	3757	2817
2006	3783	2778
2005	3828	2829
2004	3809	2842
2003	3777	2842
2002	3783	2853
2001	3707	2889
2000	3755	2899
1999	3673	2897
1998	3658	2895
1997	3648	2938
1996	3587	2963
1995	3580	2920
1994	3665	2932
1993	3605	2926
1992	3559	2943
1991	3522	2934
1990	3493	2948

YearUnited StatesJapan

1989	3433	2969
1988	3458	2941
1987	3450	2895
1986	3352	2874
1985	3380	2861
1984	3275	2827
1983	3230	2829
1982	3191	2813
1981	3218	2750
1980	3178	2798
1979	3214	2807
1978	3155	2790
1977	3135	2774
1976	3163	2751
1975	3033	2716
1974	3031	2742
1973	3040	2772
1972	3062	2781
1971	3052	2728
1970	3029	2737



Figure@ref(fig:Proportion) and Table@ref(tab:Proportions-of-the-Nutrients-Comparision) show that from 1961 to 2010, the share of per capita calorie intake in the United States and Japan did not change much, with the United States consistently having slightly higher calorie intake than Japan. From the perspective of the proportion of the three major nutrients of protein, fat and carbohydrates, the intake of fat in the American people's diet is much higher than that of the Japanese, and the intake of carbohydrates in the daily diet of the Japanese is higher than that of the United States. people. For protein intake, Americans and Japanese intakes are not much different. In summary, we can find that in terms of dietary habits, Japan and the United States show significant differences in the ratio of carbohydrates and fats in calorie intake. The American diet has more calories from fat, while the Japanese diet has more carbohydrates.



Distribution of Protein,Fat,Carbohydrates

Figure@ref(fig:Distribution-of-Protein-Fat-Carbohydrates-boxplot) shows that in terms of diet, the difference in the proportion of protein calories consumed in Japan and the United States is not large, and the values are both around 12%. The proportion of fat and carbohydrates in the calorie intake in Japan and the United States is quite different. The proportion of fat in the Japanese diet is mostly between 20% and 28%, while the proportion of fat in the American diet is between 36% and 38%. between. Carbohydrates, on the other hand, are mostly between 60% and 68% carbohydrates in the Japanese diet, compared to 50% to 52% in the American diet. We learned from the survey that this is due to the differences in food culture, geographical environment, historical and cultural differences between the two regions. The geographical location of Japan is close to the sea, and the Japanese diet is relatively light. Therefore, special attention is paid to the intake of fats and oils in the daily calorie intake. The Japanese diet has a high proportion of ramen and rice, so the proportion of carbohydrates is also high. The American diet has a high fat content, and Americans like to use cooking methods such as frying and roasting, which has also led to a large increase in the proportion of fat.

Question2

2. What is the difference between the time trends of TotalCalories and Calories of Protein, Fat, Carbohydrates in the two countries?

Table analysis of both countries

```
summary_US <- US_Data %>%
  dplyr::select(total_Cal, Protein_Cal, Fat_Cal, Carbohydrates_Cal) %>%
  summary() %>%
  knitr::kable(caption = "Calories Intake of United States") %>%
  kable_styling(latex_options = "hold_position")

summary_US
```

Calories Intake of United States

total_Cal	Protein_Cal	Fat_Cal	Carbohydrates_Cal
Min. :2858	Min. :378.3	Min. : 982.2	Min. :1481
1st Qu.:3043	1st Qu.:396.0	1st Qu.:1077.5	1st Qu.:1578
Median :3366	Median :419.8	Median :1237.6	Median :1680
Mean :3354	Mean :420.8	Mean :1221.4	Mean :1711
3rd Qu.:3650	3rd Qu.:448.5	3rd Qu.:1303.3	3rd Qu.:1863
Max. :3828	Max. :461.9	Max. :1484.9	Max. :1941

```
summary_Japan <- Japan_Data %>%
  dplyr::select(total_Cal, Protein_Cal, Fat_Cal, Carbohydrates_Cal) %>%
  summary() %>%
  knitr::kable(caption = "Calories Intake of Japan") %>%
  kable_styling(latex_options = "hold_position")

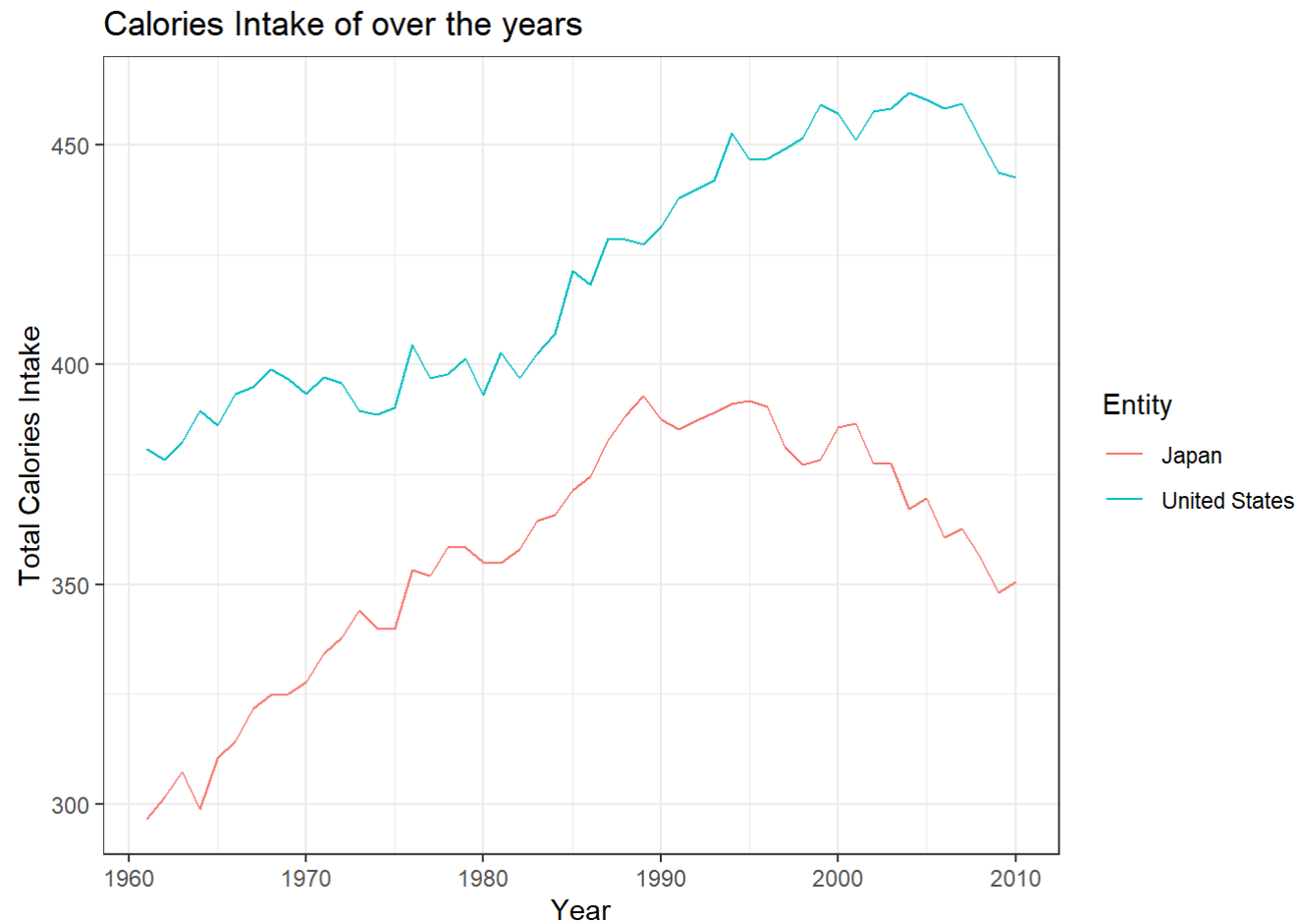
summary_Japan
```

Calories Intake of Japan

total_Cal	Protein_Cal	Fat_Cal	Carbohydrates_Cal
Min. :2525	Min. :296.8	Min. :310.4	Min. :1547
1st Qu.:2730	1st Qu.:339.9	1st Qu.:558.4	1st Qu.:1727
Median :2810	Median :359.5	Median :694.9	Median :1800
Mean :2800	Mean :357.2	Mean :652.0	Mean :1790
3rd Qu.:2895	3rd Qu.:380.6	3rd Qu.:791.8	3rd Qu.:1860
Max. :2969	Max. :392.9	Max. :815.5	Max. :1962

It can be seen from Table@ref(tab:Calories-Intake-of-United-States), that the mean Calories of United States is 3354 kcal while Table@ref(tab:Calories-Intake-of-Japan) shows Japan's mean Calories is 2800. The overall calorie intake of the American diet is significantly higher than that of the Japanese diet, which may also explain why there are many obese people in the United States. In addition, we can observe that the average carbohydrate intake of the Japanese and American diets is almost the same in terms of the average calorie intake of the three nutrients, but the fat intake of the American diet is significantly higher than that of the Japanese diet.


```
plot_Calories_Intake <- mydata%>%  
  ggplot(section2_chile_canada, mapping = aes(  
    x = Year,  
    y = Protein_Cal,  
    color = Entity)) +  
  geom_line() +  
  theme_bw() +  
  xlab("Year") +  
  ylab("Total Calories Intake") +  
  ggtitle("Calories Intake of over the years")  
plot_Calories_Intake
```



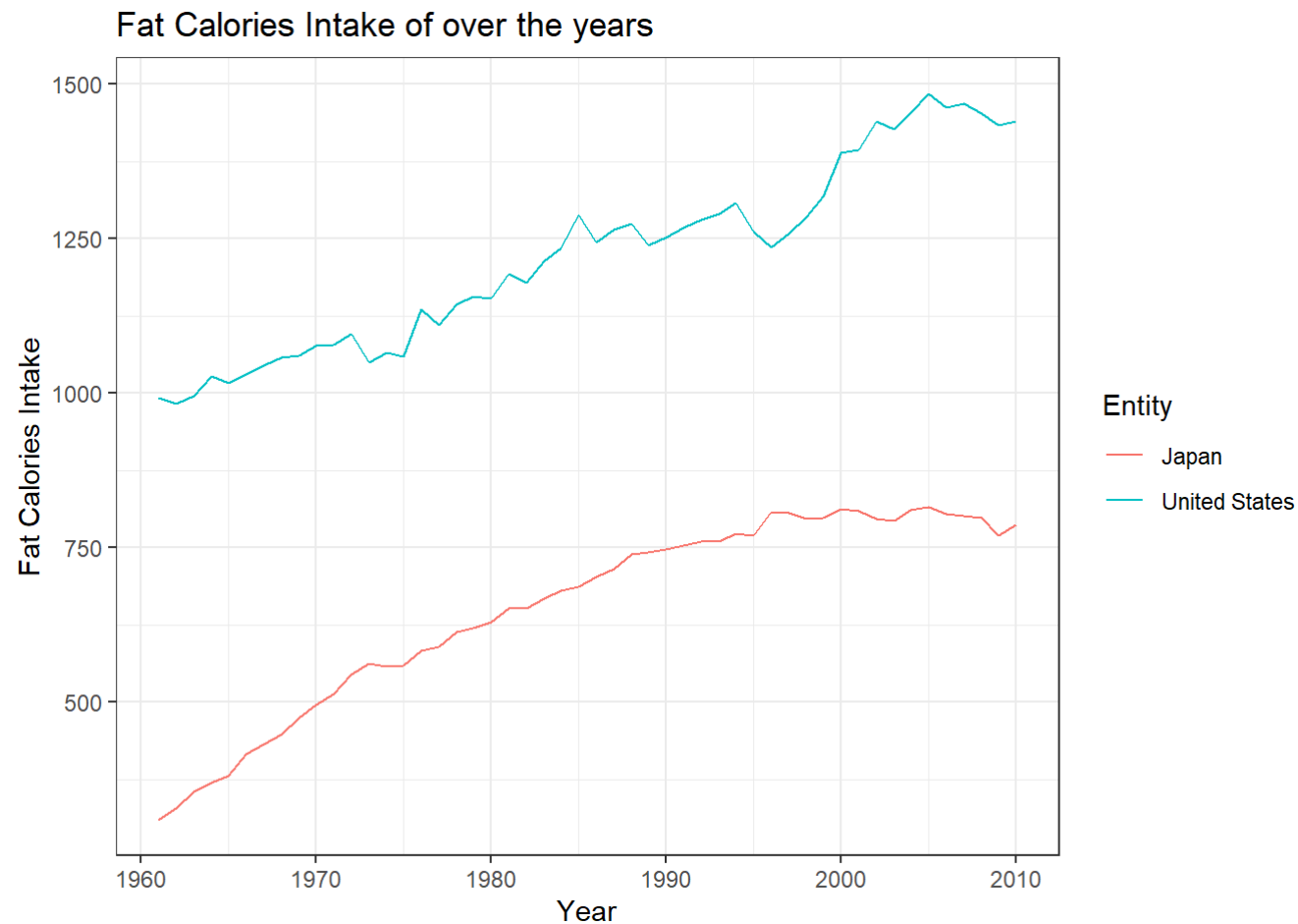
Calories Intake of over the years

Figure@ref(fig:Calories-Intake-of-over-the-years) shows the trend of total calories intake in the United States and Japan over time.

From the point of total dietary calorie intake, Figure@ref(fig:Calories-Intake-of-over-the-years) shows that dietary calorie intake in Japan first increased over the past 50 years and then gradually decreased after reaching a peak around 1995. In the United States, diets continued to increase until they began to decrease after 2000. The calorie intake gap between the two countries first decreased and then gradually increased. From the picture, we can guess that the Japanese people's awareness of dietary health came earlier than Americans. Therefore, after 1995, with the development of the economy, the Japanese gradually paid attention to dietary health and consciously reduced their calorie intake. In the United States, it was only after 2000 that the total calorie intake of the daily diet began to be reduced.

As above we found that fat is the biggest differentiating factor between the two countries. Therefore, we further investigated the trend of fat intake over time.

```
plot_Fat_Calories_Intake <- mydata%>%
  ggplot(section2_chile_canada, mapping = aes(
    x = Year,
    y = Fat_Cal,
    color = Entity)) +
  geom_line() +
  theme_bw() +
  xlab("Year") +
  ylab("Fat Calories Intake") +
  ggtitle("Fat Calories Intake of over the years")
plot_Fat_Calories_Intake
```



Fat Calories Intake of over the years

Figure@ref(fig:Fat-Calories-Intake-of-over-the-years) shows the trend of fat calories intake in the United States and Japan over time.

From the Figure@ref(fig:Fat-Calories-Intake-of-over-the-years), we can find that the intake of fat in the diet of Japan and the United States shows a trend of increasing year by year, and the gap between the two countries has changed very little in the past 50 years, and it can be seen as almost no change.

Conclusion

All in all, with the development of society and the progress of economy, how to maintain a healthy eating habit has become an increasingly important issue @1992Calories. In addition to paying attention to the total calorie intake of the diet, people also need to pay attention to the energy supply ratio of the three major nutrients, protein, fat and carbohydrates. Reasonable arrangement of the proportion of nutrients can help us maintain a healthier body and prolong our energy consumption. longevity and reduce the incidence of disease @1990Changing.