research

2022-05-20

```
# loading libraries
library(tidyverse)
library(ggplot2)
library(ggpubr)
```

Introduction: Analyzing different food items FAO concentration in Australia and at different period of time. So that we can see whether people are shifting towards being health conscious or are they taking a healthy and balanced diet or not? Because taking all the nutrients in a right amount is all necessary.

```
# reading csv file
dietary_csv <- read.csv("Data/dietary-composition-by-country.csv")
```

Research Question 1

How much FAO i.e. Fats Animal Oil is in Vegetable Oil in Australia that is consumed by people in different year?

```
# filter the data
country_vege_oils <- dietary_csv %>%
  filter(Entity == "Australia")
# selecting particular columns
selection <- country_vege_oils %>% select(Year, Vegetable.Oils..FAO..2017..)

# arranging in descending order based on Vegetable oil FAO
arrange(selection ,desc(Vegetable.Oils..FAO..2017..))
```

```
##    Year Vegetable.Oils..FAO..2017..
## 1  2012                         569
## 2  2013                         550
## 3  2010                         547
## 4  2011                         530
## 5  2004                         524
## 6  2009                         522
## 7  2005                         516
## 8  2006                         508
## 9  2007                         488
## 10 2001                         479
## 11 2008                         479
## 12 1999                         459
## 13 2002                         450
## 14 2000                         441
## 15 1992                         428
## 16 1997                         427
## 17 1993                         426
## 18 2003                         426
## 19 1998                         418
## 20 1991                         403
## 21 1996                         400
## 22 1994                         398
## 23 1995                         398
## 24 1990                         365
## 25 1989                         354
## 26 1987                         335
## 27 1988                         334
## 28 1986                         311
## 29 1985                         299
## 30 1980                         288
## 31 1982                         285
## 32 1983                         285
## 33 1981                         273
## 34 1979                         265
## 35 1984                         258
## 36 1977                         232
## 37 1978                         232
## 38 1975                         188
## 39 1976                         186
## 40 1974                         181
## 41 1973                         175
## 42 1972                         167
## 43 1970                         150
## 44 1971                         136
## 45 1969                         114
## 46 1966                         113
## 47 1967                         106
## 48 1968                         105
## 49 1965                         103
## 50 1964                         100
## 51 1963                          92
## 52 1961                          78
## 53 1962                          78
```

Research Question 2.

Comparing the FAO in maize, rice and wheat over the years in single figure to see that they all decreased, increased or differs?

```
# plotting Maize FAO on different years
maize_plot <- ggplot(country_vege_oils, aes(x = Year, y = Maize..FAO..2017..)) +
  geom_line()
```

```
# plotting Rice FAO on different years
rice_plot <- ggplot(country_vege_oils, aes(x = Year, y = Rice..FAO..2017..)) +
  geom_line()
```

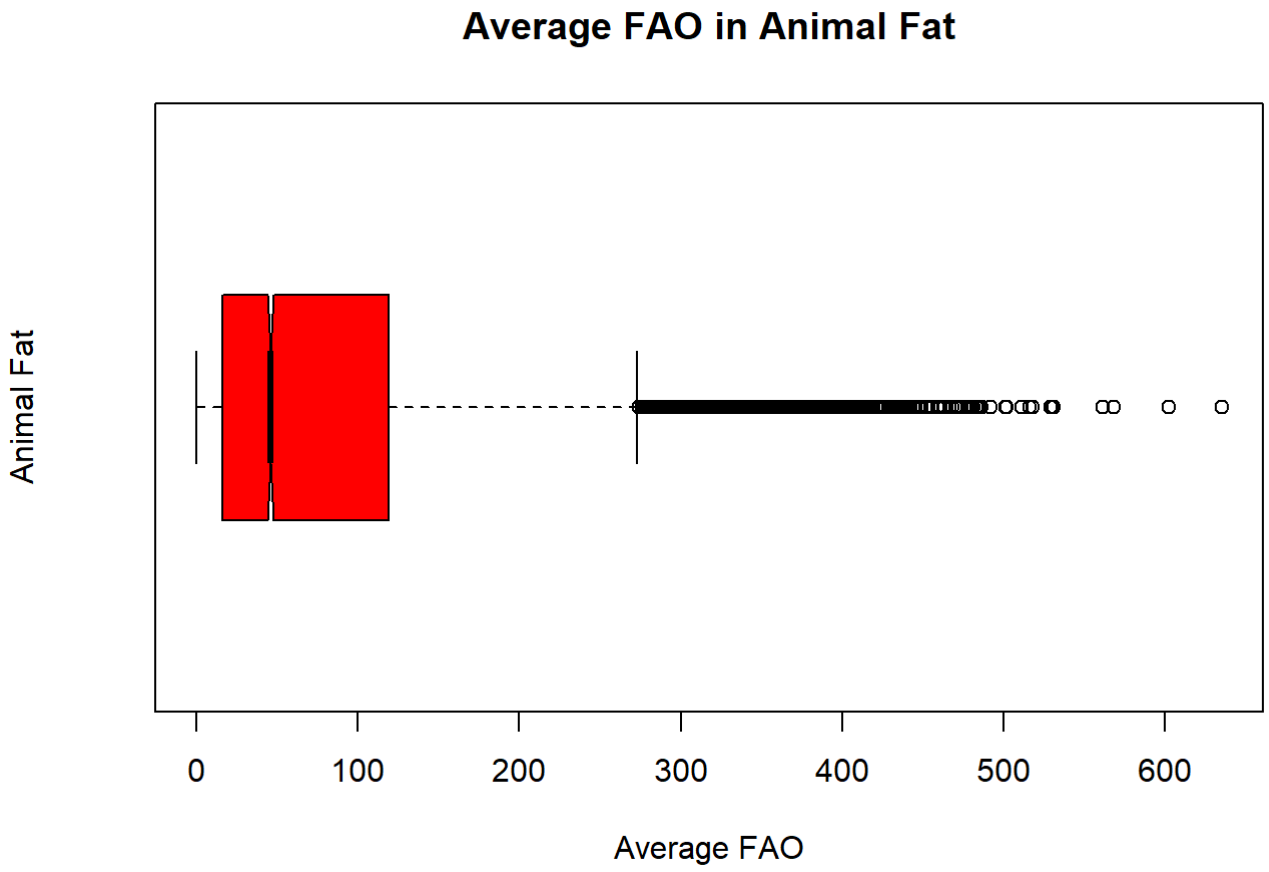
```
# plotting Wheat FAO on different years
wheat_plot <- ggplot(country_vege_oils, aes(x = Year, y = Wheat..FAO..2017..)) +
  geom_line()
```

```
# joining three plots as one figure
ggarrange(maize_plot, rice_plot, wheat_plot)
```

Research Question 3

Distribution of FAO in Animal Fat and Vegetable Oil against the averages and skewness

```
b <- boxplot(dietary_csv$Animal.fats..FAO..2017..,
        main = "Average FAO in Animal Fat",
        xlab = "Average FAO",
        ylab = "Animal Fat",
        col = "red",
        horizontal = TRUE,
        notch = TRUE)
```




```
b$stats
```

```
##      [,1]
## [1,]    0
## [2,]   16
## [3,]   46
## [4,]  119
## [5,]  273
```

Research Question 4

Finding the relation between two variables i.e. Year and FAO in Animal Fat

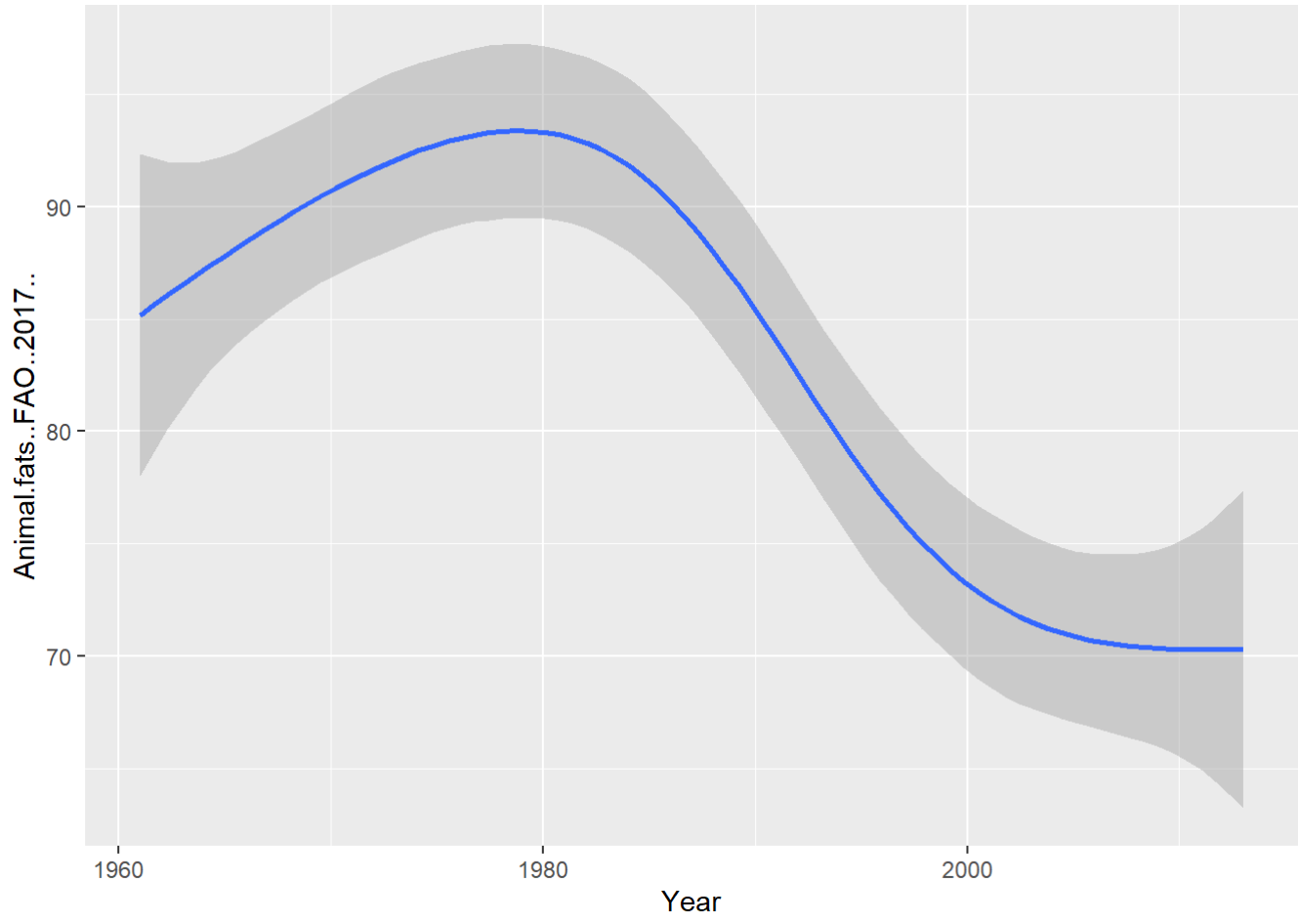
```
dietary_lm <- lm(Year ~ Animal.fats..FAO..2017..,
             data = dietary_csv)

summary(dietary_lm)
```

```
##
## Call:
## lm(formula = Year ~ Animal.fats..FAO..2017.., data = dietary_csv)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -27.2921 -13.1134   0.1706  13.1531  30.0798
##
## Coefficients:
##                             Estimate Std. Error  t value Pr(>|t|)
## (Intercept)                1.988e+03  2.144e-01 9273.059  < 2e-16 ***
## Animal.fats..FAO..2017.. -1.276e-02  1.702e-03   -7.498 7.08e-14 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 15.28 on 8979 degrees of freedom
## Multiple R-squared:  0.006223,   Adjusted R-squared:  0.006112
## F-statistic: 56.22 on 1 and 8979 DF,  p-value: 7.078e-14
```

```
ggplot(dietary_lm) +
  geom_smooth(aes(x=Year, y=Animal.fats..FAO..2017..))
```

```
## `geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
```



Conclusion:

- Maize and Rice FAO is higher in later years but the wheat growth becomes less in later years in Australia.

- Same as maize and rice, Vegetable FAO is growing in later years in Australia.
- There is no particular relation between year and Animal Fat because of different countries but it says that animal fat increases with the increase in year but gets low as well in some countries. So its fluctuating.