

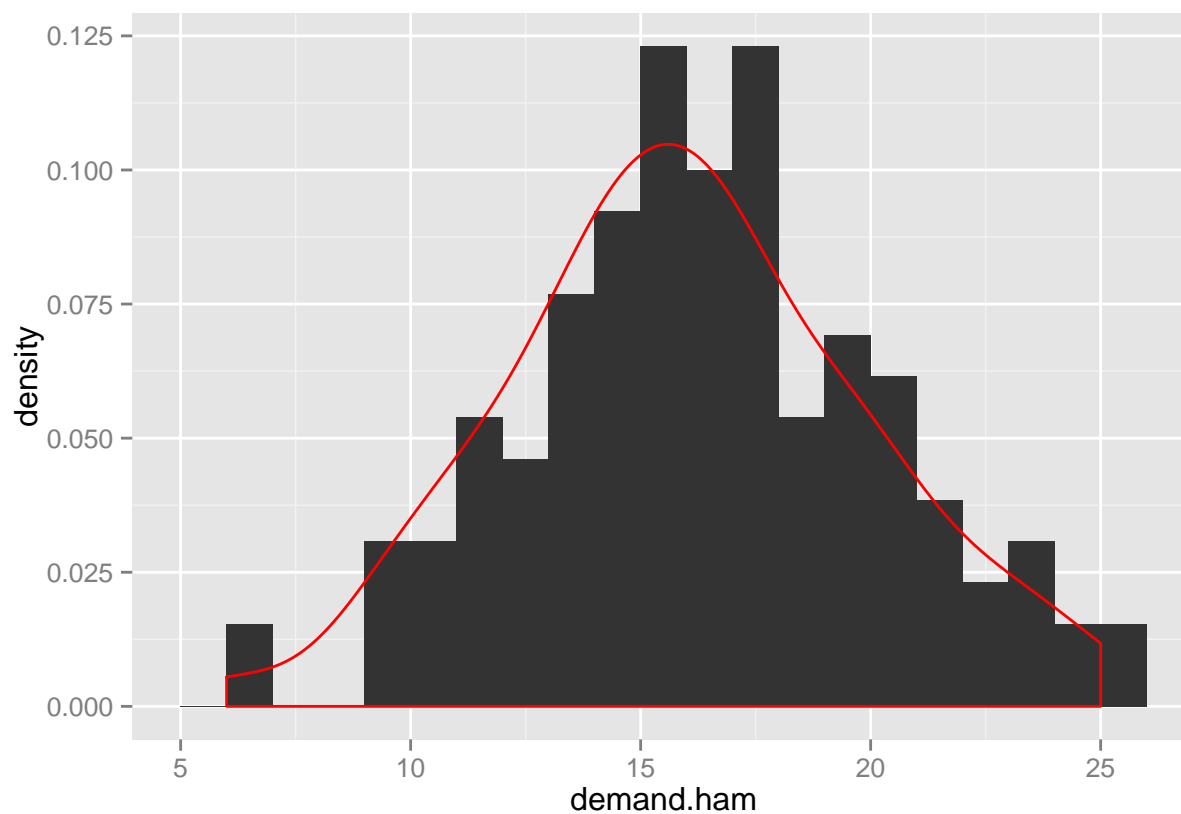
# Collaborative Assignment 1

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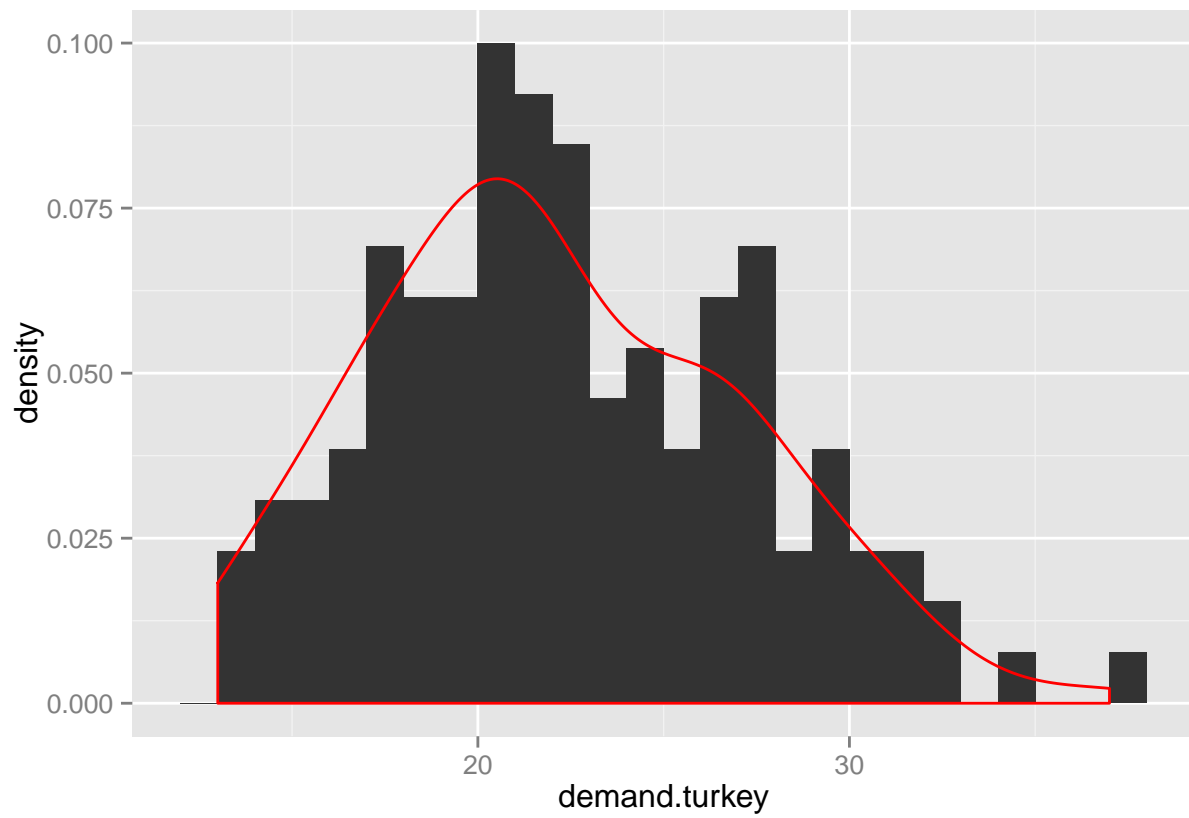
*February 26, 2015*

## Exploring the Demand Data

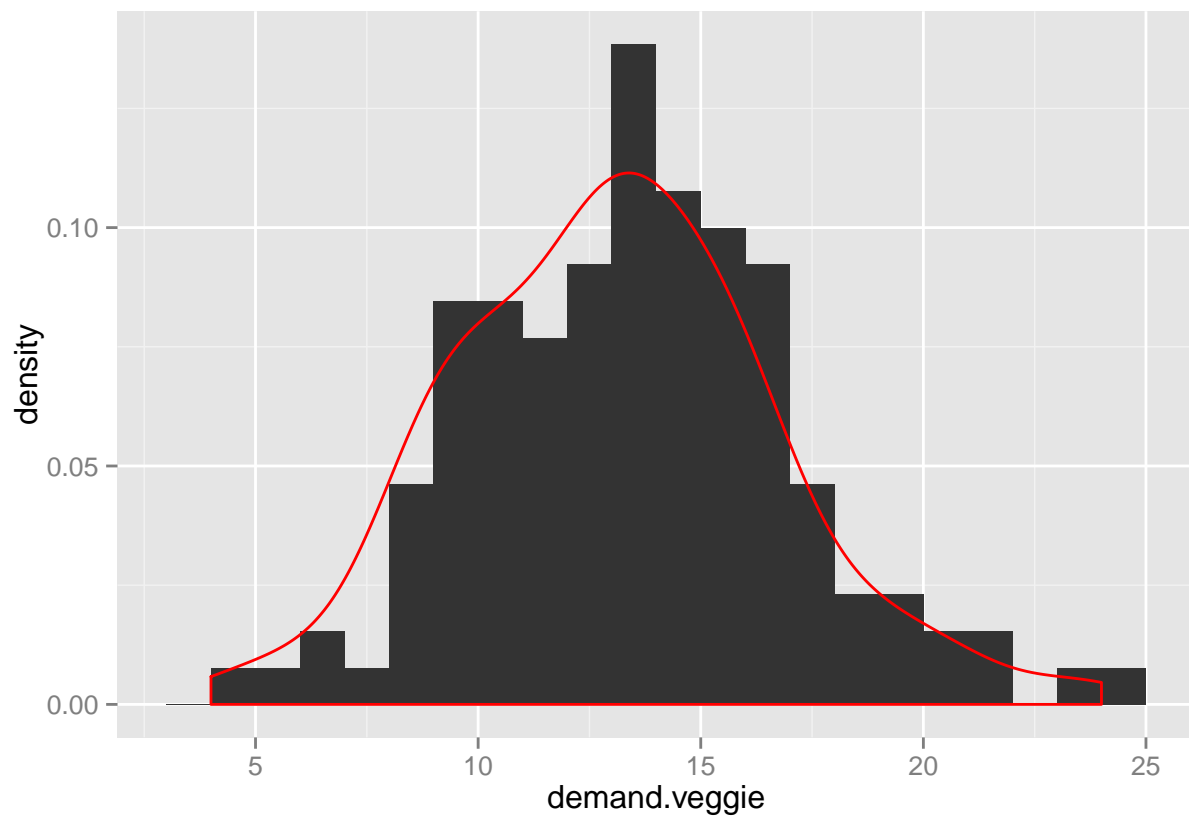
```
sales.data <- read.csv("/users/bcarancibia/CUNY_IS_606/Week2/sales.csv")
library(ggplot2)
ham.plot <- ggplot(sales.data, aes(x=demand.ham)) +
  geom_histogram(binwidth=1, aes(y = ..density..)) + geom_density(color="red")
turkey.plot <- ggplot(sales.data, aes(x=demand.turkey)) +
  geom_histogram(binwidth=1, aes(y = ..density..)) + geom_density(color="red")
veggie.plot <- ggplot(sales.data, aes(x=demand.veggie)) +
  geom_histogram(binwidth=1, aes(y = ..density..)) + geom_density(color="red")
# Display Plots
ham.plot
```



```
turkey.plot
```



veggie.plot



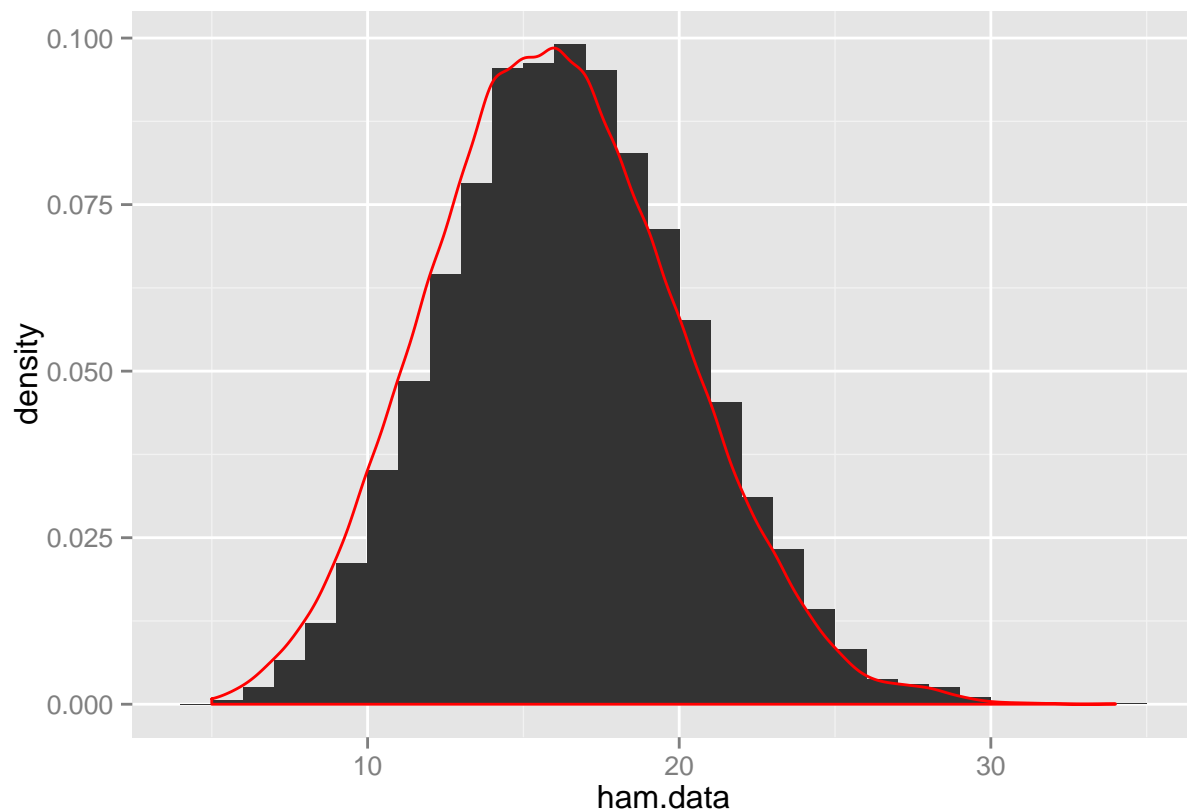
## Understanding Correlation of Sales by Sandwich Type

```
cor(sales.data[,2:4])
```

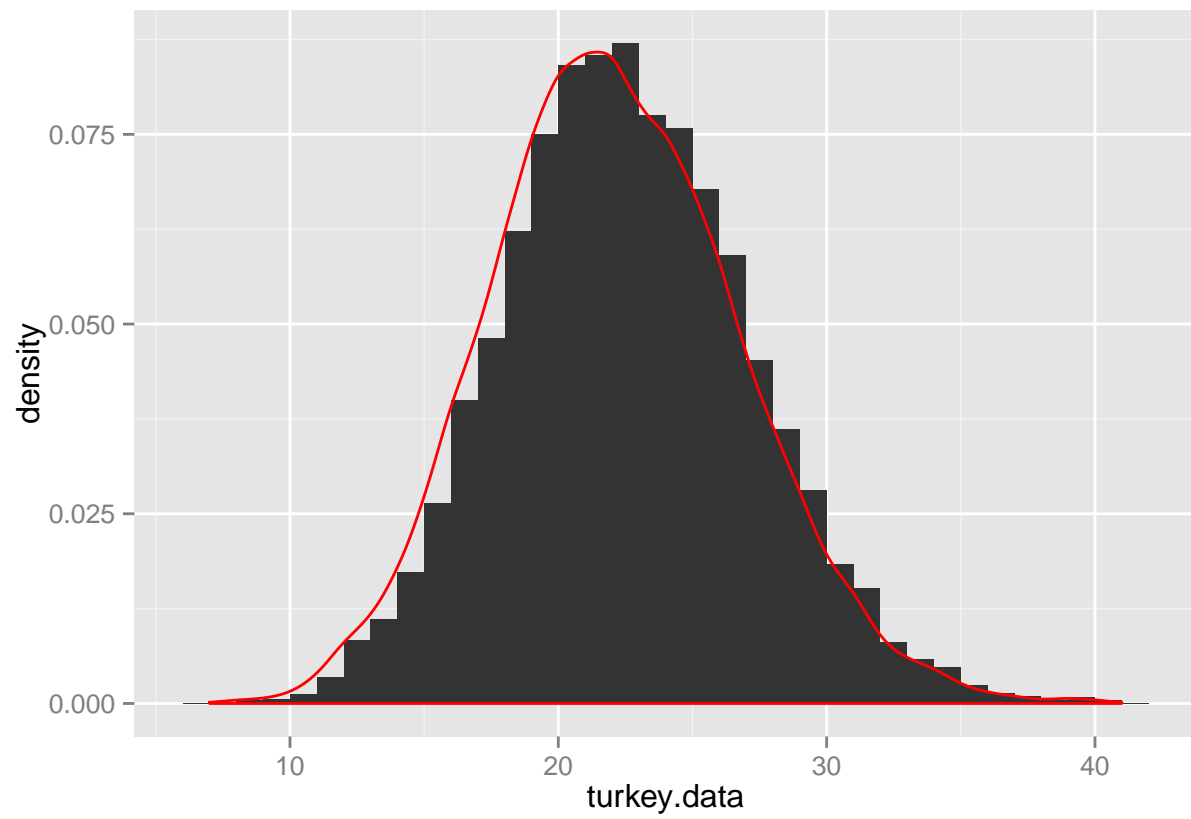
```
##                demand.ham demand.turkey demand.veggie
## demand.ham      1.0000000000  0.0005572513  0.08680582
## demand.turkey   0.0005572513  1.0000000000  0.10705333
## demand.veggie   0.0868058199  0.1070533325  1.00000000
```

## Developing Probability Density Functions by Sandwich Type

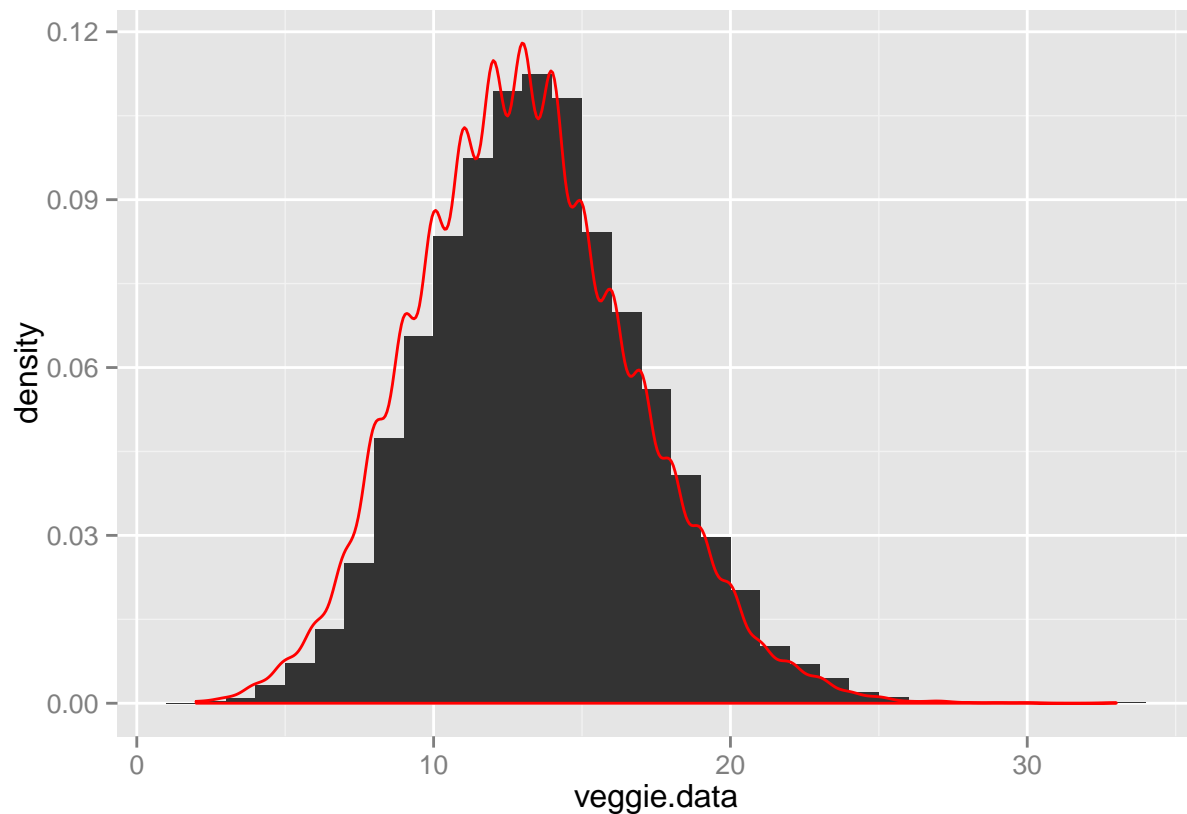
```
ham.pois <- data.frame(rpois(n=10000,lambda=mean(sales.data$demand.ham)))
names(ham.pois) <- c("ham.data")
ham.pois.plot <- ggplot(ham.pois,aes(x=ham.data)) +
  geom_histogram(binwidth=1, aes(y = ..density..)) + geom_density(color="red")
turkey.pois <- data.frame(rpois(n=10000,lambda=mean(sales.data$demand.turkey)))
names(turkey.pois) <- c("turkey.data")
turkey.pois.plot <- ggplot(turkey.pois,aes(x=turkey.data)) +
  geom_histogram(binwidth=1, aes(y = ..density..)) + geom_density(color="red")
veggie.pois <- data.frame(rpois(n=10000,lambda=mean(sales.data$demand.veggie)))
names(veggie.pois) <- c("veggie.data")
veggie.pois.plot <- ggplot(veggie.pois,aes(x=veggie.data)) +
  geom_histogram(binwidth=1, aes(y = ..density..)) + geom_density(color="red")
# Display Plots
ham.pois.plot
```



```
turkey.pois.plot
```



```
veggie.pois.plot
```



### Understanding the Cost/Benefit for Inventory Levels

```
price.cost <- read.csv("/users/bcarancibia/CUNY_IS_606/Week2/details.csv")
price.cost$profit <- price.cost$price - price.cost$cost

inv.levels <- data.frame(cbind(0:50,0))
names(inv.levels) <- c("inv", "profits")

# Ham
ham.inv.levels <- inv.levels
ham.samples <- rpois(n=100000, lambda=mean(sales.data$demand.ham))

for (i in 0:50) {
  temp <- data.frame(ham.samples)
  names(temp) <- c("demand")
  temp$total.cost <- i * 3.5
  temp$total.revenue <- i * 6.50
  temp$total.revenue[temp$demand <= i] <- temp$demand[temp$demand <= i] * 6.50
  temp$profit <- temp$total.revenue - temp$total.cost
  ham.inv.levels[i+1,2] <- mean(temp$profit)
}

# Turkey
turkey.inv.levels <- inv.levels
turkey.samples <- rpois(n=100000, lambda=mean(sales.data$demand.turkey))
```

```

for (i in 0:50) {
  temp <- data.frame(turkey.samples)
  names(temp) <- c("demand")
  temp$total.cost <- i * 4
  temp$total.revenue <- i * 6.50
  temp$total.revenue[temp$demand <= i] <- temp$demand[temp$demand <= i] * 6.50
  temp$profit <- temp$total.revenue - temp$total.cost
  turkey.inv.levels[i+1,2] <- mean(temp$profit)
}

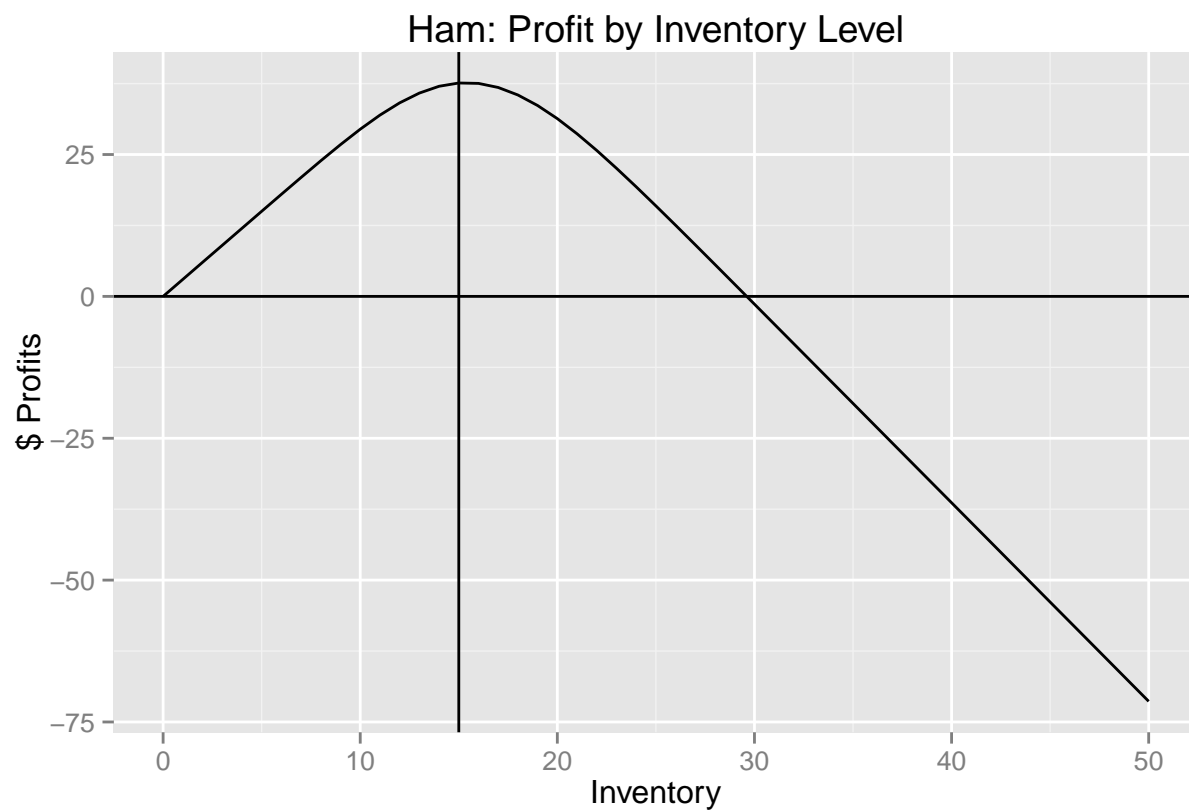
# Veggie
veggie.inv.levels <- inv.levels
veggie.samples <- rpois(n=100000,lambda=mean(sales.data$demand.veggie))

for (i in 0:50) {
  temp <- data.frame(veggie.samples)
  names(temp) <- c("demand")
  temp$total.cost <- i * 3.5
  temp$total.revenue <- i * 6.50
  temp$total.revenue[temp$demand <= i] <- temp$demand[temp$demand <= i] * 6.50
  temp$profit <- temp$total.revenue - temp$total.cost
  veggie.inv.levels[i+1,2] <- mean(temp$profit)
}

ham.profit.plot <- ggplot(ham.inv.levels,aes(x=inv, y=profits)) +
  geom_hline(aes(yintercept=0)) + geom_line() + ggtitle("Ham: Profit by Inventory Level") +
  xlab("Inventory") + ylab("$ Profits") +
  geom_vline(aes(xintercept=
    ham.inv.levels[
      ham.inv.levels$profits==max(ham.inv.levels$profits),1]))
turkey.profit.plot <- ggplot(turkey.inv.levels,aes(x=inv, y=profits)) +
  geom_hline(aes(yintercept=0)) + geom_line() + ggtitle("Turkey: Profit by Inventory Level") +
  xlab("Inventory") + ylab("$ Profits") +
  geom_vline(aes(xintercept=
    turkey.inv.levels[
      turkey.inv.levels$profits==max(turkey.inv.levels$profits),1]))
veggie.profit.plot <- ggplot(veggie.inv.levels,aes(x=inv, y=profits)) +
  geom_hline(aes(yintercept=0)) + geom_line() + ggtitle("Veggie: Profit by Inventory Level") +
  xlab("Inventory") + ylab("$ Profits") +
  geom_vline(aes(xintercept=
    veggie.inv.levels[
      veggie.inv.levels$profits==max(veggie.inv.levels$profits),1]))

# Display Plots
ham.profit.plot

```



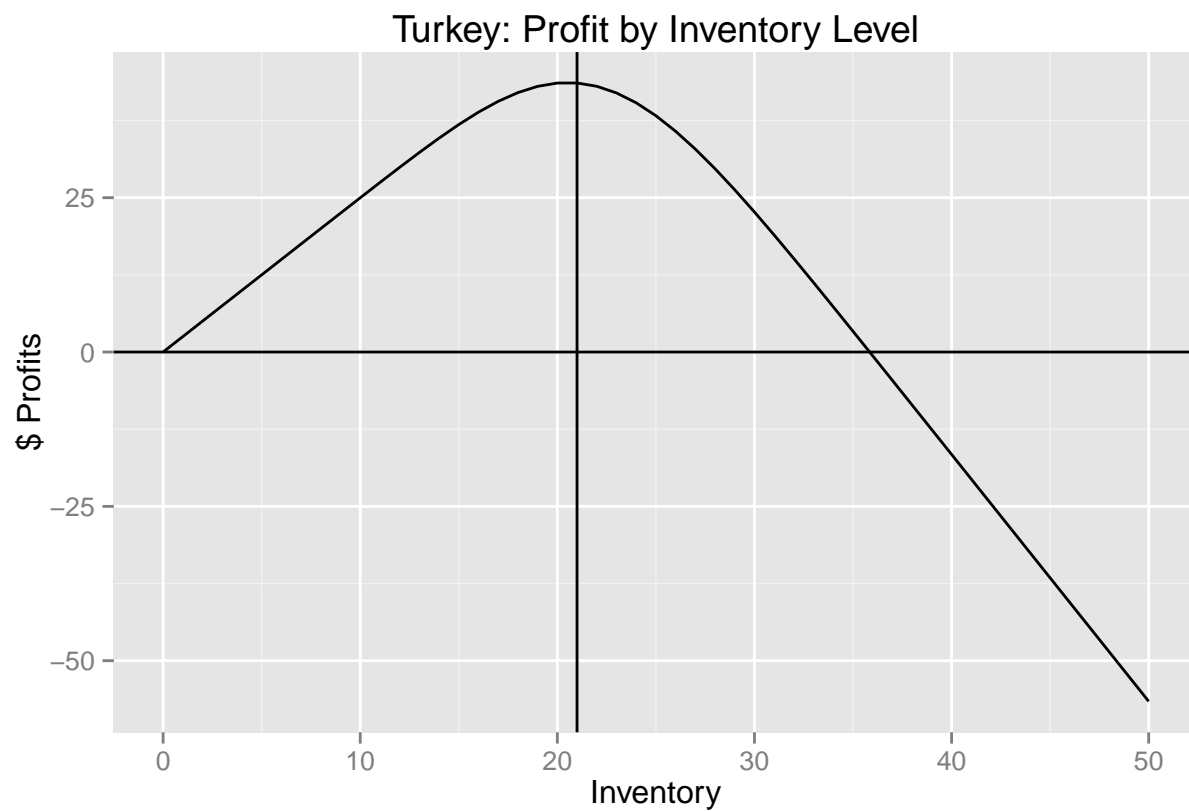
```
mean(sales.data$demand.ham)
```

```
## [1] 15.94615
```

```
ham.inv.levels[ham.inv.levels$profits==max(ham.inv.levels$profits),1]
```

```
## [1] 15
```

```
turkey.profit.plot
```



```
mean(sales.data$demand.turkey)
```

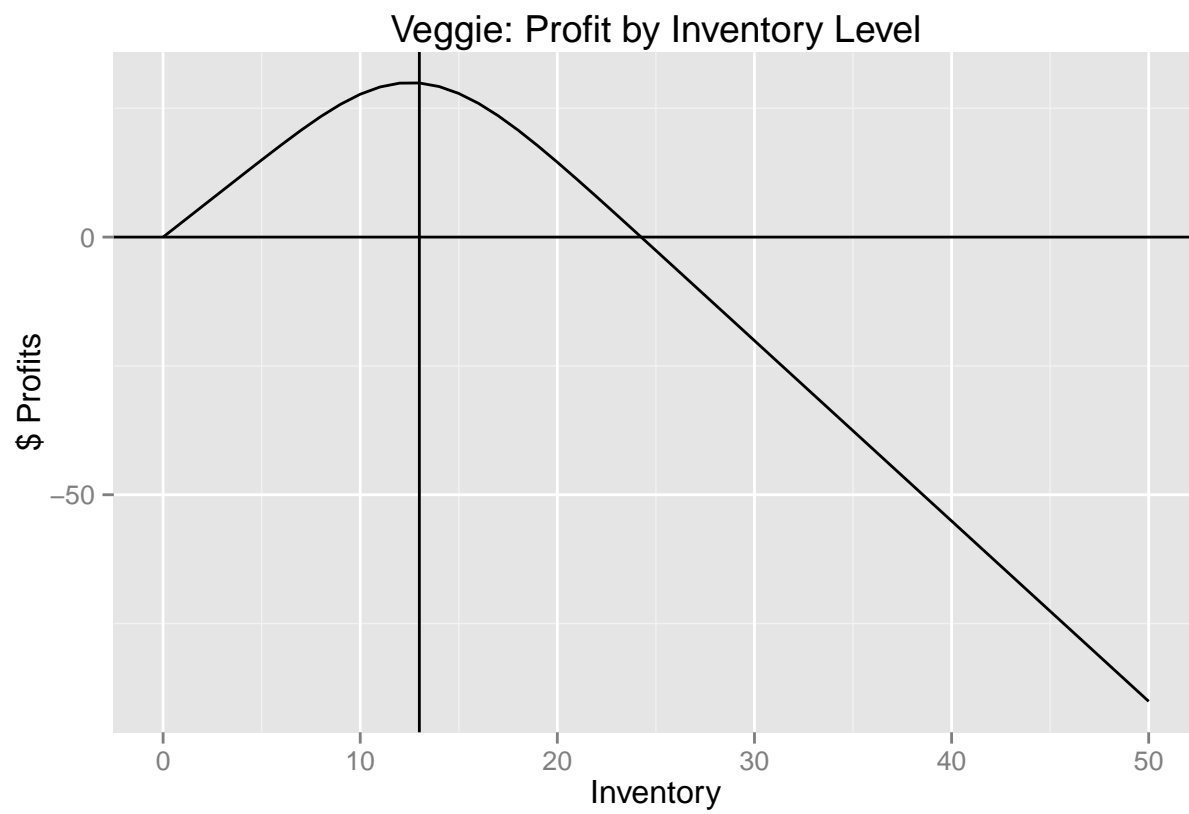
```
## [1] 22.05385
```

```
turkey.inv.levels[turkey.inv.levels$profits==max(turkey.inv.levels$profits),1]
```

```
## [1] 21
```

```
veggie.profit.plot
```





```
mean(sales.data$demand.veggie)
```

```
## [1] 13.06154
```

```
veggie.inv.levels[veggie.inv.levels$profits==max(veggie.inv.levels$profits),1]
```

```
## [1] 13
```