Cheese Regression

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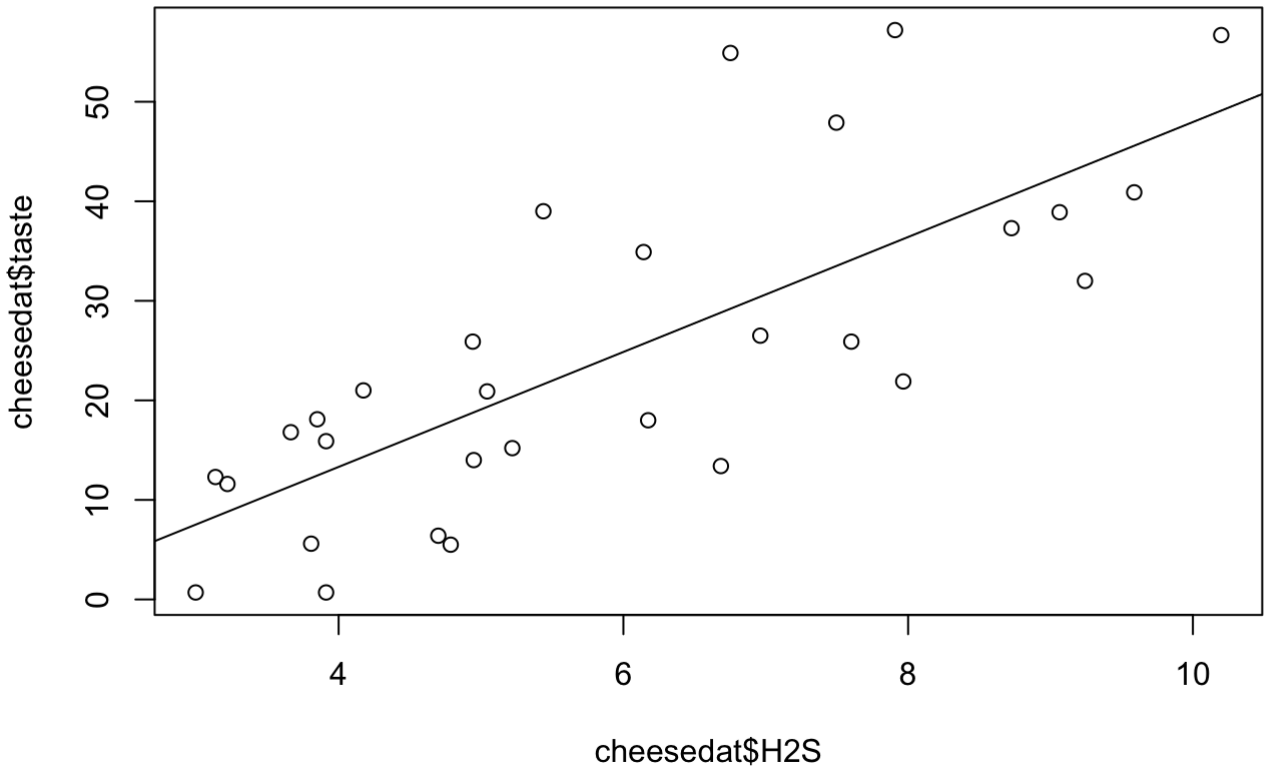
With H2S as Predictor

```
plot(cheesedat$taste ~ cheesedat$H2S)
abline(lm(cheesedat$taste ~ cheesedat$H2S))
```



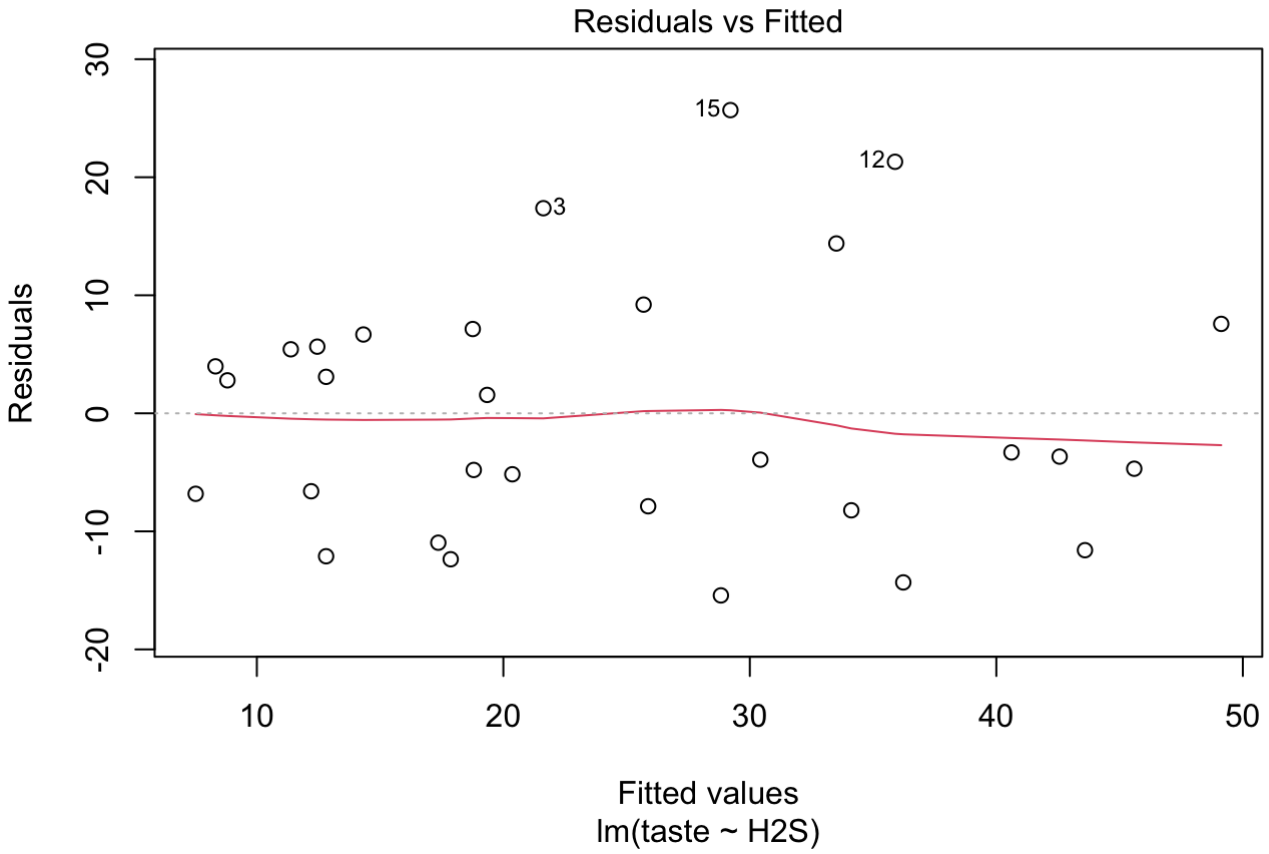

```
reg <- lm(taste ~ H2S, dat = cheesedat)
summary(reg)
```

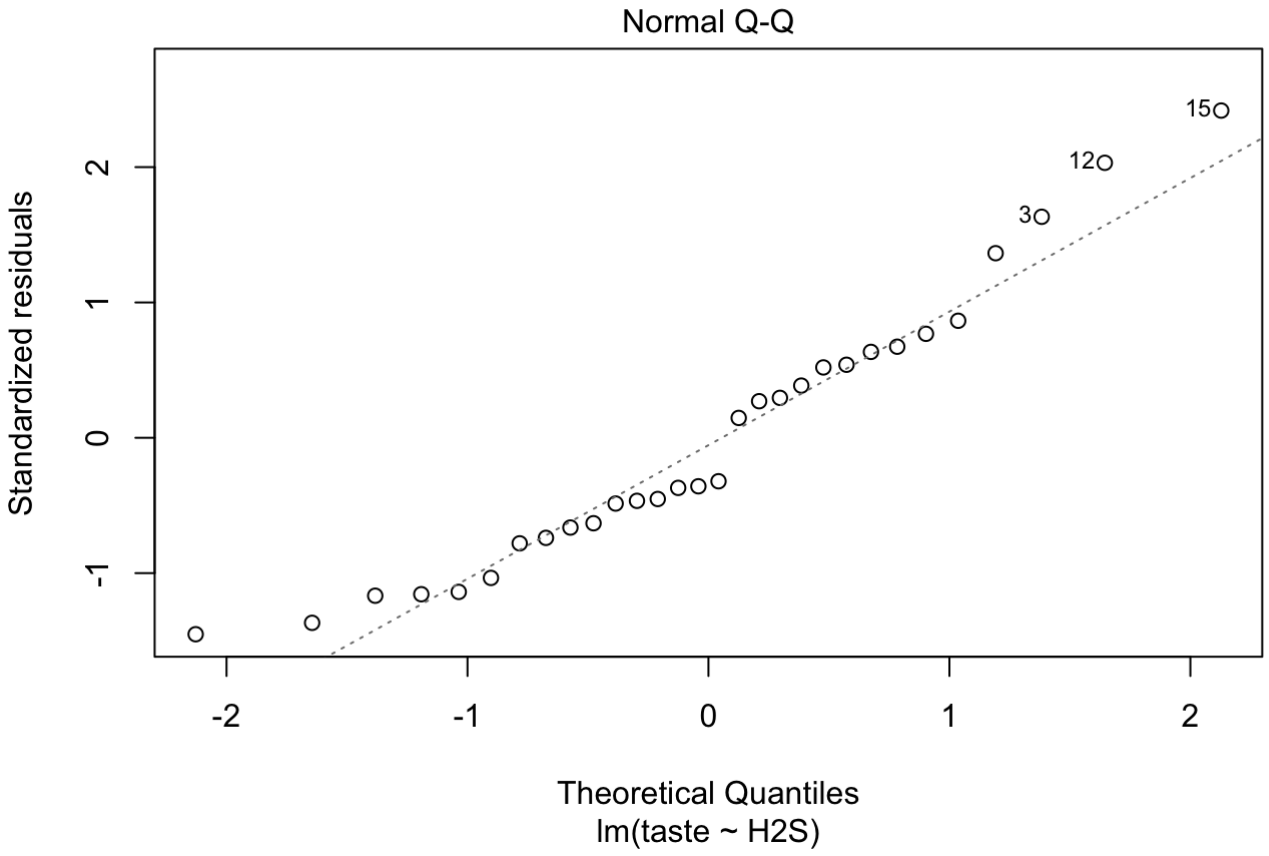
```
##
## Call:
## lm(formula = taste ~ H2S, data = cheesedat)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -15.426  -7.611  -3.491   6.420  25.687
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -9.7868     5.9579  -1.643    0.112
## H2S           5.7761     0.9458   6.107 1.37e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.83 on 28 degrees of freedom
## Multiple R-squared:  0.5712, Adjusted R-squared:  0.5558
## F-statistic: 37.29 on 1 and 28 DF,  p-value: 1.374e-06
```

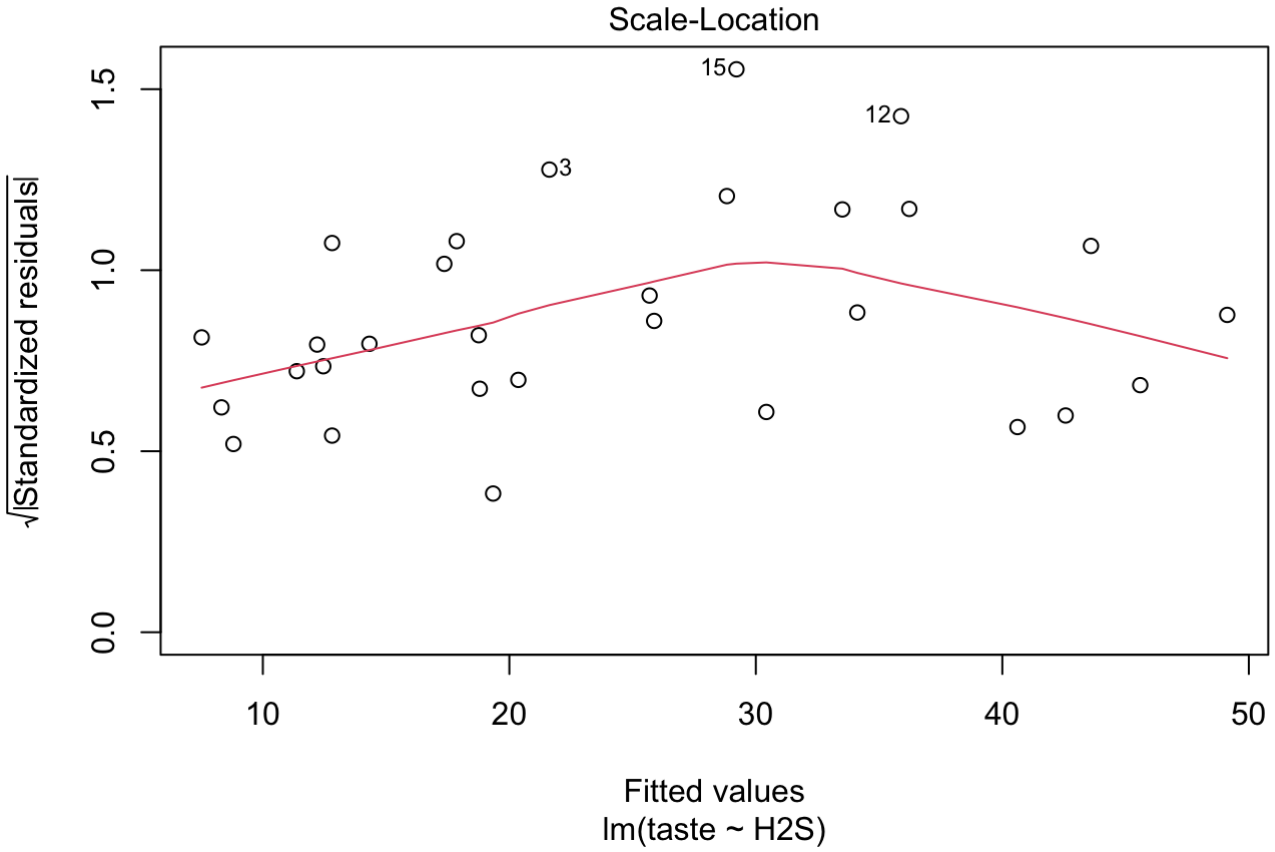
```
anova(reg)
```

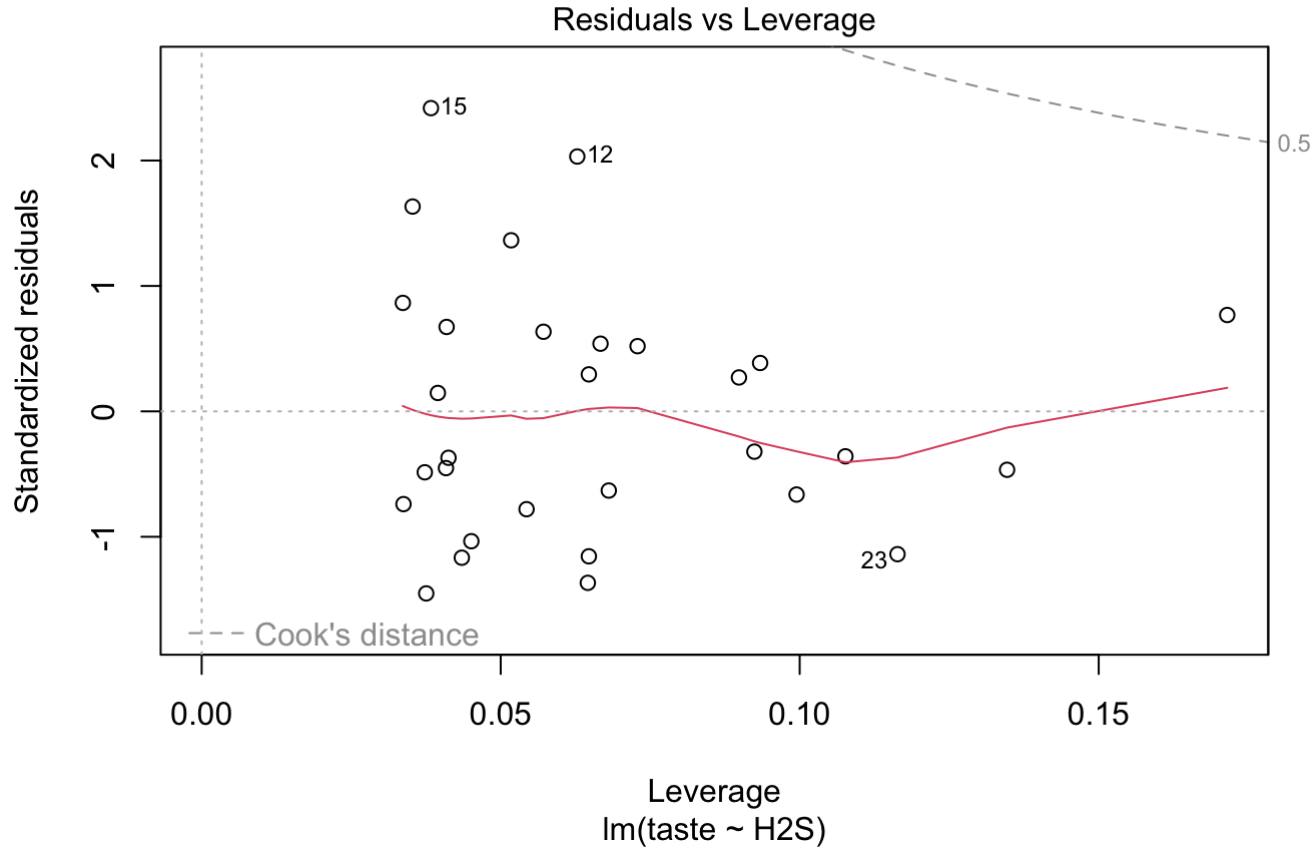
```
## Analysis of Variance Table
##
## Response: taste
##           Df Sum Sq Mean Sq F value    Pr(>F)
## H2S        1 4376.7  4376.7  37.293 1.374e-06 ***
## Residuals 28 3286.1   117.4
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
plot(reg)
```


Residuals vs Fitted
Residuals
Fitted values
lm(taste ~ H2S)
15
12
3
30
20
10
0
-10
-20
10
20
30
40
50

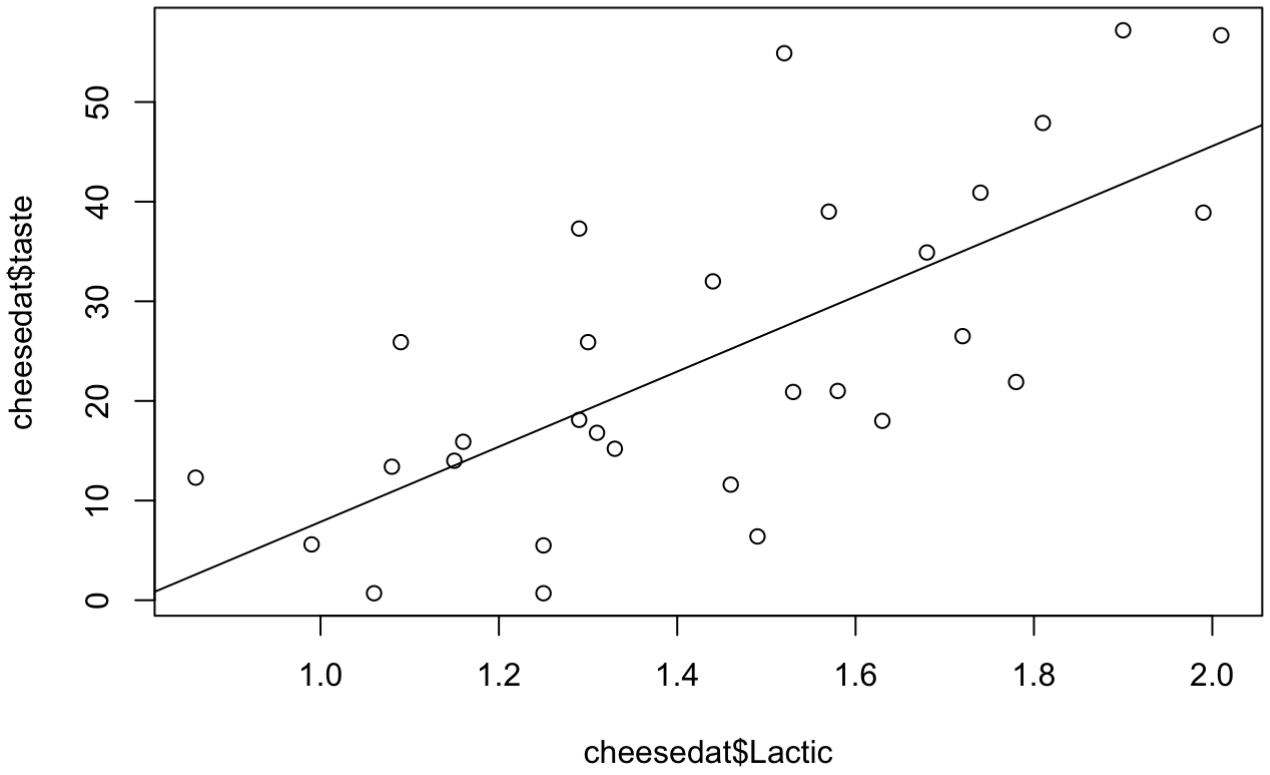

Normal Q-Q
Standardized residuals
Theoretical Quantiles
lm(taste ~ H2S)
15
12
3
2
1
0
-1
-2


Scale-Location
√|Standardized residuals|
0.0
0.5
1.0
1.5
15
12
3
10
20
30
40
50
Fitted values
lm(taste ~ H2S)


Residuals vs Leverage
Standardized residuals
-1
0
1
2
15
12
23
0.5
Cook's distance
0.00
0.05
0.10
0.15
Leverage
lm(taste ~ H2S)

With Lactic as Predictor

```
plot(cheesedat$taste ~ cheesedat$Lactic)
abline(lm(cheesedat$taste ~ cheesedat$Lactic))
```



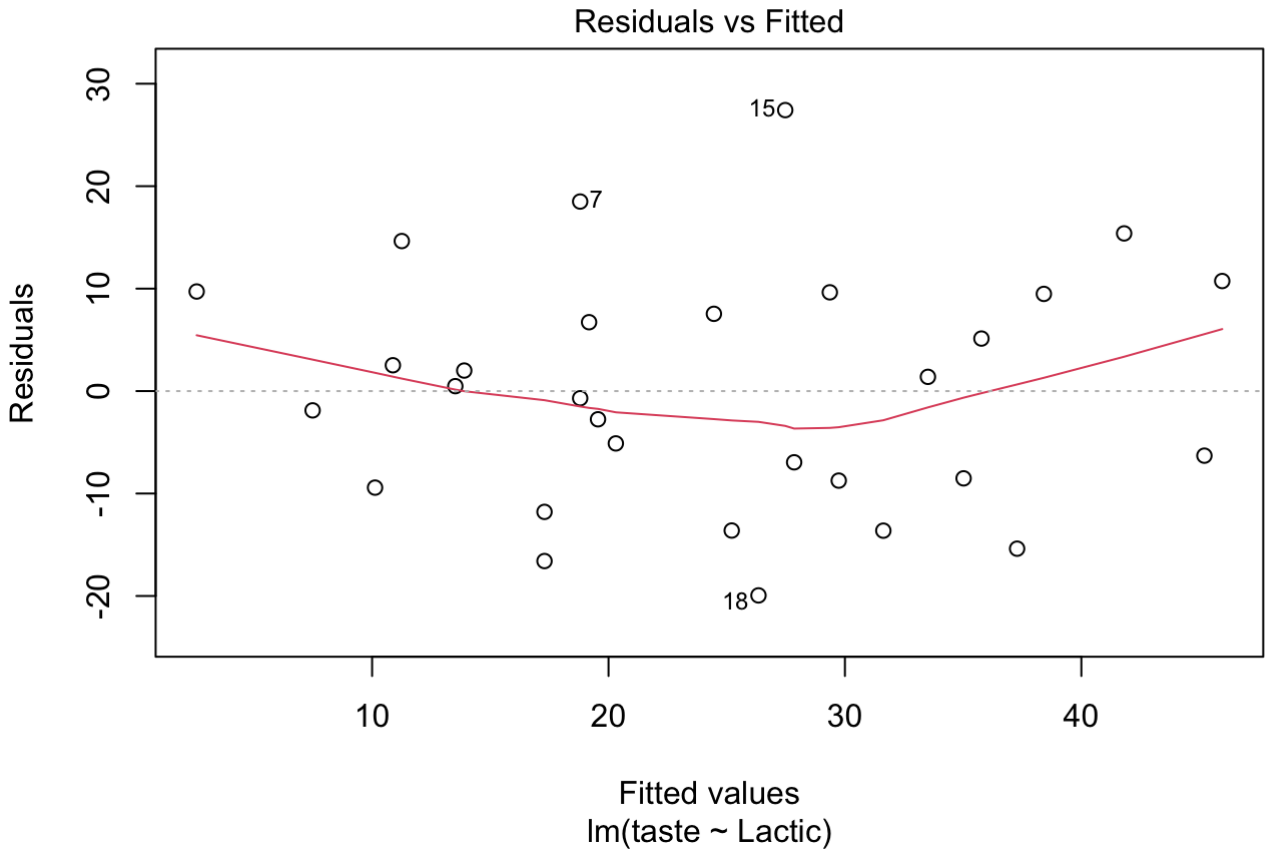

```
reg1 <- lm(taste ~ Lactic, dat = cheesedat)
summary(reg1)
```

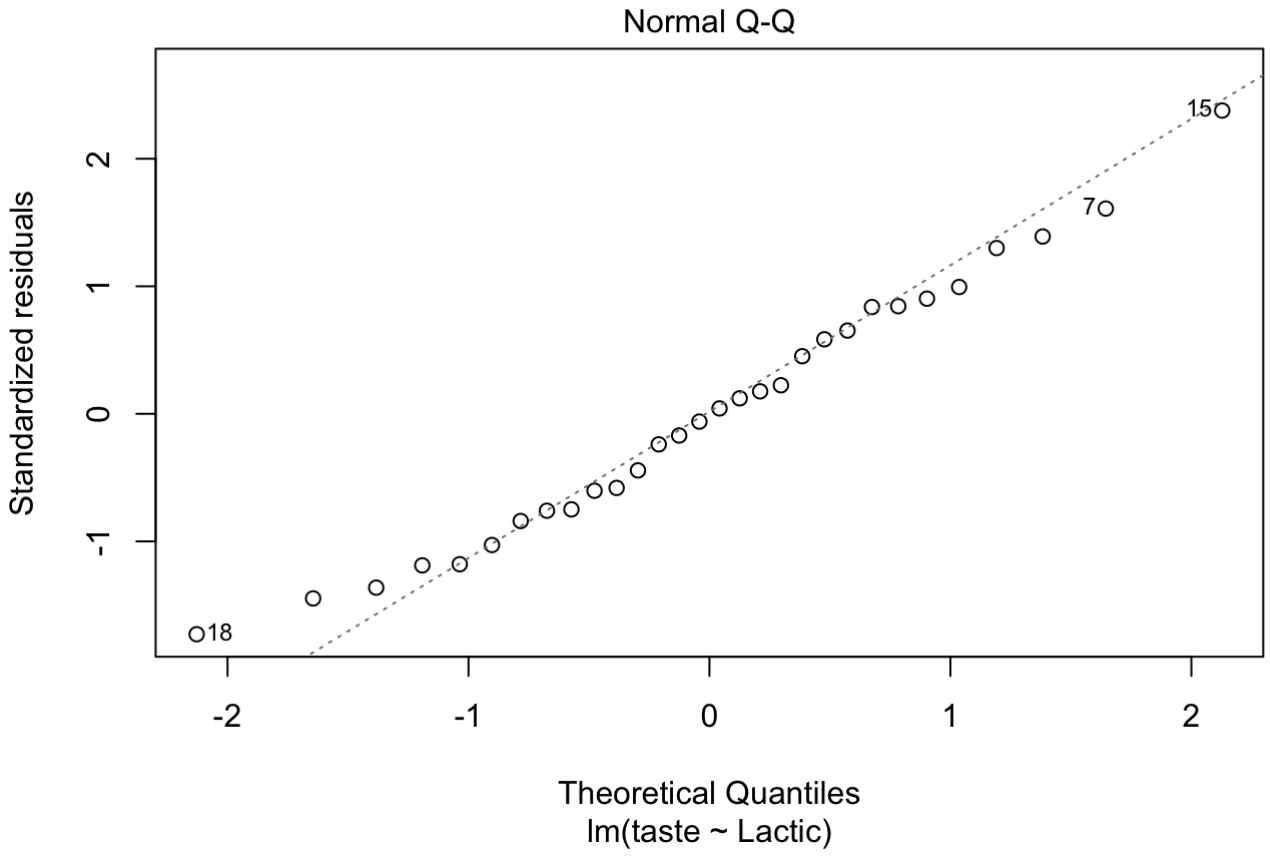
```
##
## Call:
## lm(formula = taste ~ Lactic, data = cheesedat)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -19.9439  -8.6839  -0.1095   8.9998  27.4245
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -29.859     10.582  -2.822  0.00869 **
## Lactic        37.720      7.186   5.249 1.41e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.75 on 28 degrees of freedom
## Multiple R-squared:  0.4959, Adjusted R-squared:  0.4779
## F-statistic: 27.55 on 1 and 28 DF,  p-value: 1.405e-05
```

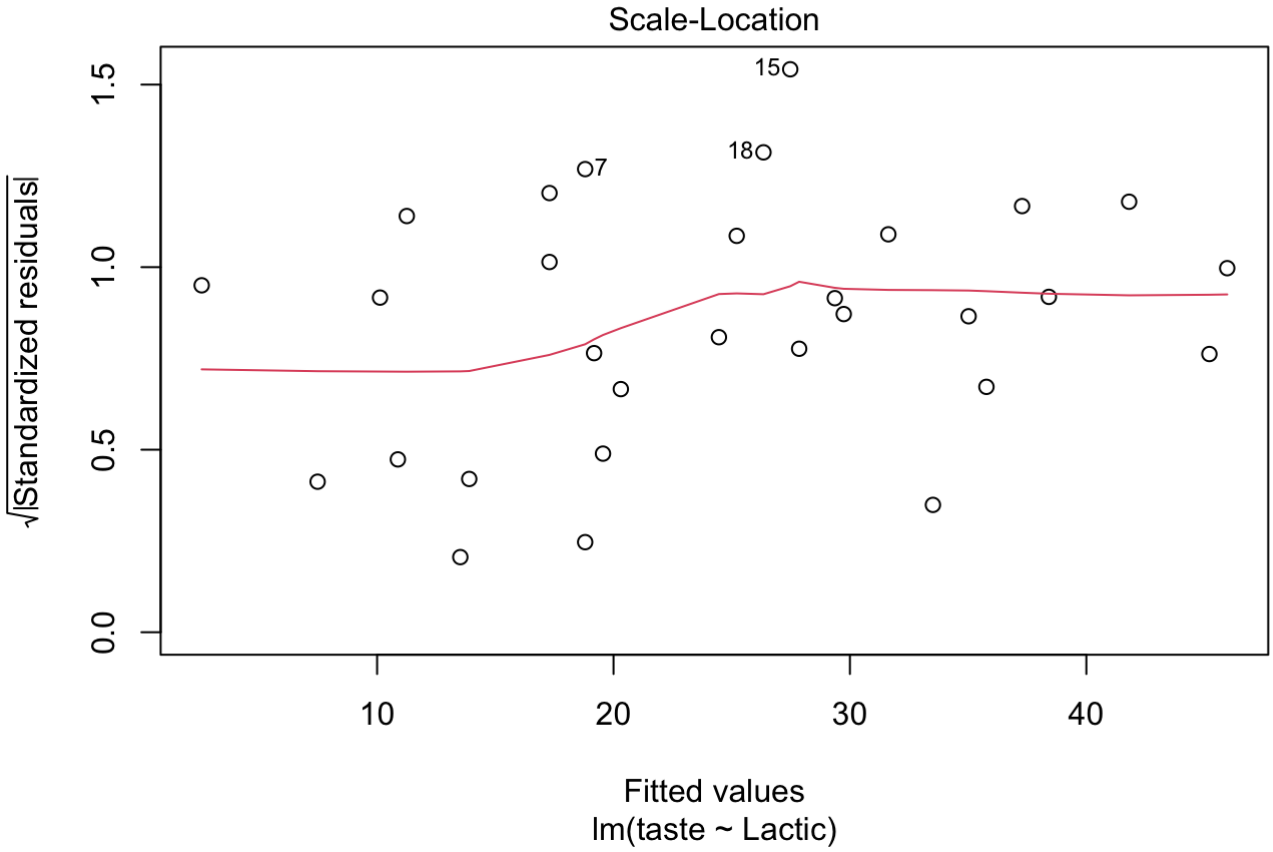
```
anova(reg1)
```

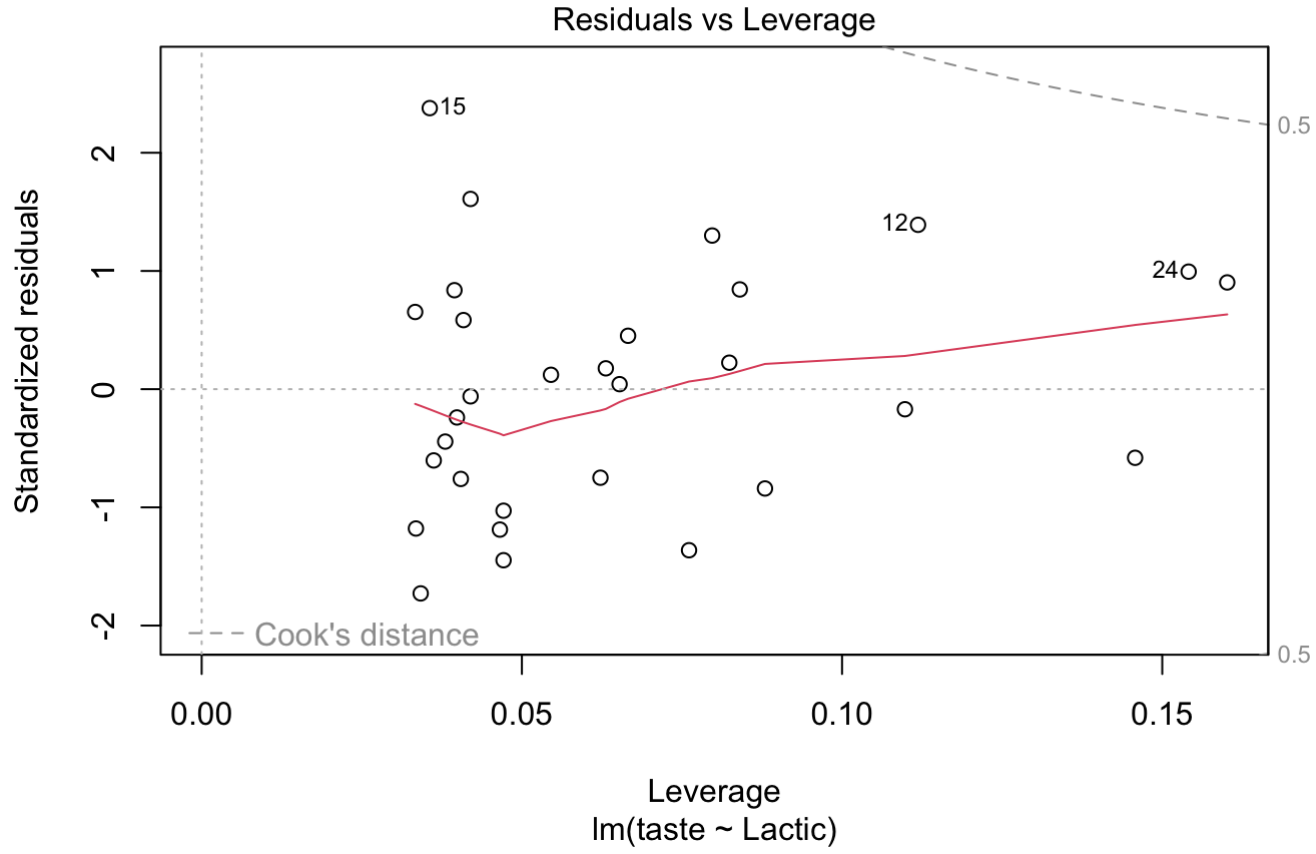
```
## Analysis of Variance Table
##
## Response: taste
##           Df Sum Sq Mean Sq F value    Pr(>F)
## Lactic     1 3800.4  3800.4   27.55 1.405e-05 ***
## Residuals 28 3862.5   137.9
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
plot(reg1)
```


Residuals vs Fitted
Residuals
Fitted values
lm(taste ~ Lactic)
15
7
18
30
20
10
0
-10
-20
10
20
30
40


Normal Q-Q
Standardized residuals
Theoretical Quantiles
lm(taste ~ Lactic)
15
7
18
2
1
0
-1
-2


Scale-Location
√|Standardized residuals|
0.0
0.5
1.0
1.5
15
18
7
10
20
30
40
Fitted values
lm(taste ~ Lactic)


Residuals vs Leverage
Standardized residuals
-2
-1
0
1
2
15
12
24
0.5
0.5
Cook's distance
0.00
0.05
0.10
0.15
Leverage
lm(taste ~ Lactic)

```
# 95% CI and expected value when Lactic = 0.90
x.9 <- data.frame(Lactic = 0.90)
expected.value <- predict(reg1, x.9)
expected.value
```

```
##        1
## 4.089121
```

```
interval <- predict(reg1, x.9, interval = 'confidence', level = 0.95)
interval
```

```
##        fit       lwr      upr
## 1 4.089121 -5.018677 13.19692
```