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Analysis of the calories and the fat: Cereal Dataset

Information on the distribution of various groups of nutrients among seventy-seven commonly available breakfast cereals was obtained from the *statistical graphics exposition* in 1993. Is there a relationship between the calories and the fat (in grams)? If so, is the relationship proportional?

A plot of the relationship between calories and the fat (Figure 1) showed a linear relationship. The estimated relationship (R-Square= 0.2084; p < .0001) is

Calories = 95.13 (SE 3.14) + 9.81 (SE 2.21)*Fat

Therefore, the calories will increase 104.94 as the fat increase in 1 gram. The standard error of slope is 2.21, so p-value < 0.0001(p-value<0.05). So we can conclude that there is a positive relationship between the calories and fat. The 95% confidence interval for the slope is from 5.41 to 14.20. It means the calories will increase 5.41 at minimum and 14.20 at minimum when the fat increase by 1 gram. The huge difference may due to other nutrients' affect and it can be explained by the low R-Square in this model. So we cannot get an certain number of the proportion with high confidence level. An estimate of the calories per serving for a cereal with 4 grams of fat is 134.37. And for the two measures of uncertainty, we are 95% confident to say that the calories is between 116.77 and 151.91 when the cereal is 4 grams. The two measures of uncertainty was bounded by the blue area in Figure 1.

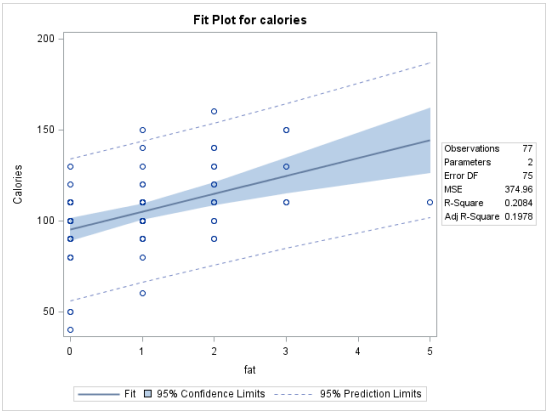

Figure 1. Relationship between calories and fat(g)

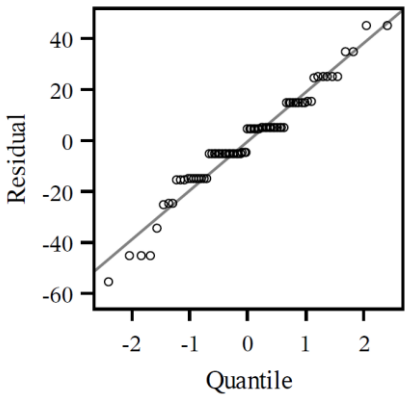

Figure 2. QQ plot of the residual not show any large scale outliers from normality of the residuals.