Brand vs. Calories

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| **Tests of Normality** | | | | | | | |
|  | Manufacturer | Kolmogorov-Smirnova | | | Shapiro-Wilk | | |
|  | Statistic | df | Sig. | Statistic | df | Sig. |
| Calories | General Mills | .370 | 22 | .000 | .765 | 22 | .000 |
| Kellogs | .219 | 23 | .006 | .899 | 23 | .025 |
| Nabisco | .293 | 6 | .117 | .915 | 6 | .473 |
| Post | .209 | 9 | .200\* | .889 | 9 | .194 |
| Quaker Oats | .318 | 8 | .017 | .771 | 8 | .014 |
| Ralston Purina | .337 | 8 | .008 | .806 | 8 | .033 |
| \*. This is a lower bound of the true significance. | | | | | | | |
| a. Lilliefors Significance Correction | | | | | | | |

Since both the Kolmogorov-Smirnov test and the Shapiro-Wilk test for all but two of the manufacturers, ‘Nabisco’ and ‘Post’, gave out a p-value (sig) of 0 < 0.05, then the hypothesis that ‘Calories’ follows a normal distribution has to be rejected. ‘Calories’ is thus not normally distributed.

The following table presents the results for Levene’s tests. Levene’s test is used to check whether the assumption of equal variances is satisfied. In this case we have the following hypothesis:

* H0: The variances of the manufacturers from which the samples are extracted are equal.
* H1: The variances of the manufacturers from which the samples are extracted are not equal.

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| **Test of Homogeneity of Variances** | | | |
| Calories | | | |
| Levene Statistic | df1 | df2 | Sig. |
| 2.576 | 5 | 70 | .034 |

Since the p-value is 0.034, which is less than 0.05, then we reject the null hypothesis. So there is a significant difference in the six manufacturers’ variances.

This implies that the ‘One-Way Anova’ test cannot be carried out as not all manufacturers have a normally distributed calories count and their variances are not equal. Therefore, the non-parametric ‘Kruskal Wallis’ test is used.

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| **Test Statisticsa,b** | |
|  | Calories |
| Chi-Square | 12.970 |
| df | 5 |
| Asymp. Sig. | .024 |
| a. Kruskal Wallis Test | |
| b. Grouping Variable: Manufacturer | |

Since the p-value is 0.024, which is less than the level of significance, 0.05, H0 is rejected. So there is a significant difference in the median calories found in the cereals produced by the different manufacturers. Post hoc tests can than be applied to

tests which means are actually significantly different.