

GENERIC VS NAME BRAND POPCORN

Jenna Weeks, Haley Uicab, and Mackenzie Dwight

04/17/2017

Introduction:

The purpose of this project is to collect data and determine if Orville Redenbacher brand or generic brand is really better or are both just as good in terms of the quality of the kernel.

Definition and Assumptions:

Our initial hypothesis of our project is that the name brand popcorn would have an easier time popping than generic brand. In turn allowing us to assume that it would have more kernels popped and less unpopped kernels. Giving us the idea that (Orville Redenbacher) μ_1 will have less unpopped kernels than μ_2 (Generic Brand). Or in statistical terminology $\mu_1 < \mu_2$.

1. Name brand will have less unpopped kernels.
2. We assume that we will reject the null hypothesis of $\mu_1 = \mu_2$, and accept the alternate hypothesis of $\mu_1 < \mu_2$.

Methodology:

In order to collect the data, we sampled two types of popcorn. One named brand sample of Orville Redenbacher and the other a sample of a generic store brand. To test the quality of the samples kernels we used two paper bags each labeled generic or Orville Redenbacher. Next, we measured out 1 ounce of kernels in each respected bag and popped them in the microwave separately on the same popcorn setting of the same microwave. We decided the best way to gather the data would be to weigh the leftover kernels after the popcorn setting cycle was done. We zeroed out the scale with an empty paper bag for more accuracy. Then we picked out the unpopped kernels of each bag and weighed them respectively.

Complications:

When collecting and processing our sample we ran into an issue. While picking out the unpopped kernels, there were some kernels that were either half or barely popped. We decided to discard them with the rest of the popped popcorn and not count them towards the unpopped kernels. This may have introduced an error into our sample. We also ran into the issue of not providing enough testing in the beginning of our project, but now that we have more evidence we are extremely confident in our final results.

Results:

For the experiment portion of the project we did ten rounds of popping for each brand. We popped the popcorn twenty times each in the math lab microwave using a paper bag. The results of unpopped kernels of the Orville Redenbacher popcorn test experiment were; 0.1368, 0.1691, 0.2073, 0.1734, 0.0641, 0.0082, 0.1483, 0.1529, 0.1328, 0.0719, 0.1467, 0.1689, 0.1523, 0.1364, 0.1240, 0.1813, 0.2123, 0.0921, 0.1728, 0.1253. The results for the unpopped generic kernels was; 0.2583, 0.2491, 0.3176, 0.2391, 0.2383, 0.1762, 0.4820, 0.2256, 0.3218, 0.2766, 0.3276, 0.2768, 0.2933, 0.4523, 0.2843, 0.3857, 0.5232, 0.3281, 0.2835, 0.4276.

For the hypothesis test we used a significance level of 0.05. We assumed the null hypothesis to be of little difference in amount of unpopped kernels between the named brand Orville Redenbacher and the generic Walmart brand. Our alternative hypothesis was that the amount of Orville Redenbacher unpopped kernels would be less than that of the generic brand.

Discussion:

When reviewing our data we discovered that the data shows that the generic brand popcorn had more unpopped kernels than the Orville Redenbacher brand.

Sample Sizes:	$n_1 = 20$	$n_2 = 20$
Sample Means:	$\bar{x}_1 = 0.139$	$\bar{x}_2 = 0.318$
Sample Standard Deviations:	$s_1 = 0.049$	$s_2 = 0.092$
Degrees of Freedom:	$df = 29$	
Critical t Value:	$t^* = 2.04523$	
95% Confidence Interval:	$(-0.227, -0.132)$	
t statistic:	$t = -7.708$	
p value:	$p = 0$	

Interpretation: Assuming that $\mu_1 = \mu_2$, the probability of seeing a test statistic $t = -7.708$ or smaller is 0.

Conclusion:

Reject the null hypothesis. ($0 = p < \alpha = 0.05$)

Conclusion:

We fail to accept the null hypothesis of $\mu_1 = \mu_2$, and we do accept our hypothesis of $\mu_1 < \mu_2$.

There is significant evidence to reject the null hypothesis because with a negative t statistic of -7.708, we find the p-value at 0.00. This leads us to believe that Orville Redenbacher is a much better buy, in terms of quality of kernel, than Generic Walmart Brand popcorn.