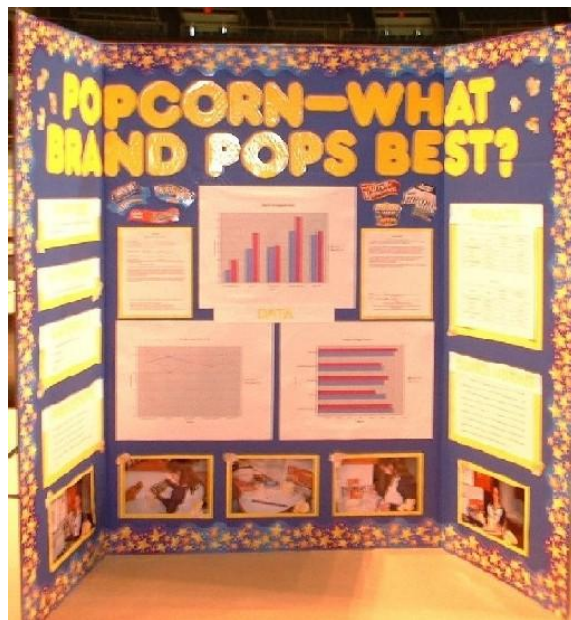


Pop Goes the Popcorn



by: #50 - Block I

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Question:

Which brand of popcorn pops the most kernels of popcorn; Orville Redenbacher, Jolly Time, or Publix Brand?

Hypothesis:

If I pop 3 different types of popcorn (Orville Redenbacher, Jolly Time, & Publix Brand) in the microwave, then Orville Redenbacher will have the fewest kernels left over because their ads say they pop every kernel.

Background Information:

Popcorn differs from other types of corn in that its hull has just the right thickness to allow it to burst open. Popcorn "pops" when a tiny amount of water contained in the kernel is superheated and turns to steam. When enough pressure builds up inside the kernel, it ruptures, and some starch previously contained within the kernel fuses together as it cools to form a fluffy solid.

Because the driving force behind this change is water being converted to steam (a change of state), and nothing chemically new is made, this is a **physical change**.

Popcorn needs between 13.5-14% moisture to pop. The soft starch is surrounded by the kernel's hard outer surface. As the kernel heats up, the water begins to expand. Around 212 degrees the water turns into steam and changes the starch inside each kernel into a superhot gelatinous goop. The kernel continues to heat to about 347 degrees. The pressure inside the grain will reach 135 pounds per square inch before finally bursting the hull open.

As it explodes, steam inside the kernel is released. The soft starch inside the popcorn becomes inflated and spills out, cooling immediately and forming into the odd shape we know and love. A kernel will swell 40-50 times its original size!

This information impacts my experiment and hypothesis because according to Orville Redenbacher Popcorn ads, their popcorn pops every kernel. In order for this to be a true statement, then their popcorn must have the perfect combination of moisture content and hull thickness.

Material List:

- 1 working microwave
- 3 - 8oz packages of Orville Redenbacher popcorn
- 3 - 8oz packages of Jolly Time popcorn
- 3 - 8oz packages of Publix Brand popcorn
- 1 stop watch
- 1 large bowl
- 1 cookie sheet
- Data notebook
- pencil

Variables:

Independent Variable:

- The brand of popcorn

Controlled Variable:

- Same microwave
- Use the microwave's popcorn setting for each bag

Dependent Variable:

- The amount of unpopped kernels

Procedure List:

PHASE ONE:

1. Gather all materials on material list
2. Pop the Orville Redenbacher popcorn using the pre-set time on the microwave
3. When the bag is finished allow it to cool on the kitchen counter while popping the next bag of popcorn.
4. Pop the Jolly Time popcorn using the pre-set time on the microwave
5. When the bag is finished allow it to cool on the kitchen counter while popping the next bag of popcorn.
6. Pop the Publix Brand popcorn using the pre-set time on the microwave.
7. When the bag is finished allow it to cool on the kitchen counter

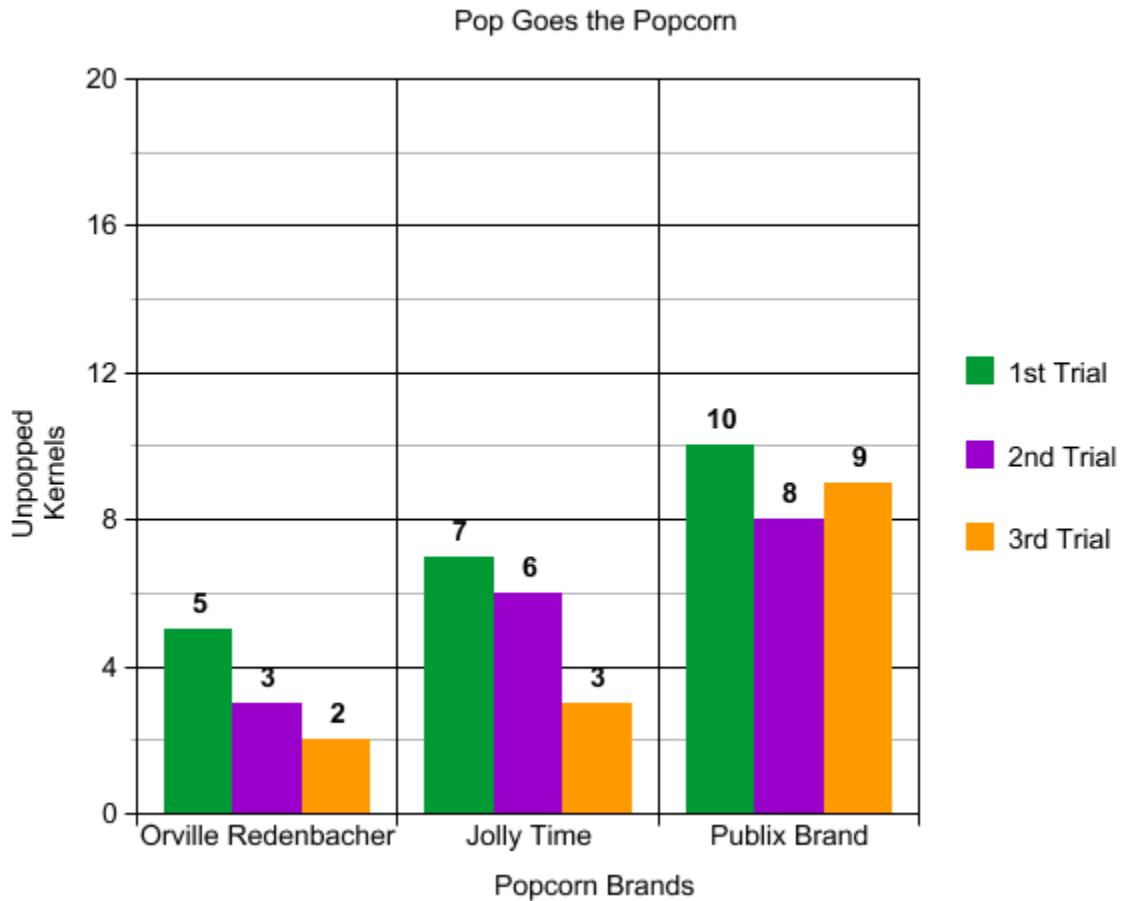
PHASE TWO:

8. Open the Orville Redenbacher popcorn and pour it onto the cookie sheet, then remove the popped kernels and place them in the bowl.
9. Count the number of unpopped kernels - record information in data notebook.
10. Repeat steps 8 & 9 with the Jolly Time & Publix Brand popcorn.

PHASE THREE:

Repeat the experiment & data collection 2 additional times rotating the sequence of which brand goes first.

Data Analysis:



In my data I found the following averages of unpopped popcorn:

Orville Redenbacher: 3.3

Jolly Time: 5.3

Publix Brand: 9

The results of the data indicated that Orville Redenbacher had the fewest number of un-popped popcorn kernels.

Conclusion:

My original question was... "Does Orville Redenbacher popcorn pop more kernels than other types of popcorn?" My answer is.... YES!

My original hypothesis was..."If I pop 3 different types of popcorn (Orville Redenbacher, Jolly Time, & Publix Brand) in the microwave, then Orville Redenbacher will have the fewest kernels left over because their ads say they pop every kernel." My hypothesis was correct!

According to my research popcorn differs from other types of corn in that its hull has just the right thickness to allow it to burst open. Each kernel of popcorn contains a small drop of water stored inside a circle of soft starch. Popcorn needs between 13.5-14% moisture to pop. The soft starch is surrounded by the kernel's hard outer surface.

Based on my research and the results of my experiment, I believe that Orville Redenbacher brand popcorn sells a product containing the perfect thickness of hull and proper moisture needs.

Bibliography Page

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Recommendation:

I would rate the effectiveness of my experiment to be very high. My hypothesis was based on the fact that Orville Redenbacher Popcorn claims to pop ever kernel. I proved this to be true.

If I was to do this experiment again, I think I would only do one trial per day. This would prevent the microwave getting too hot and skewing the results.