

The Secrets of Popcorn



Americans have a love affair with popcorn. Popcorn is so popular in the United States that the average American eats about 54 to 70 quarts of popped popcorn per year, both at home and at entertainment events like the movie theatre and sporting events. About seventy percent of popcorn is made and consumed at home.

Americans love the convenience of microwave popcorn so much that microwave ovens come with a pre-programmed button labeled "Popcorn." It's so easy to make popcorn in the microwave. Simply put the specially made bag of microwave popcorn in the oven, hit the "Popcorn" button, and seconds later the room is filled with the aroma of freshly popped popcorn. It's also easy to make popcorn on the stove using a deep pan and specialty stores still sell old-fashioned popcorn poppers for use over an open fire.

Have you ever thought about how and why popcorn pops? Examine a popcorn kernel and this pebble-sized piece of grain is as hard as rock. The popcorn kernel is simply not edible. Apply the right amount of heat though and, as if by magic, this rocky kernel bursts forth in a mini-explosion into a soft, fluffy, and very tasty edible treat. The average popcorn kernel expands 35 to 38 times its original size while extra fluffy varieties of popcorn expand 40 times their original size.

The key to optimal popping is the moisture content of the popcorn kernels. The reason that the moisture content of popcorn is so important is that the water stored inside the popcorn kernel is the propellant, so to speak, behind the final explosion that turns the hard kernel into the fluffy snack that we so enjoy. As the un-popped kernel is heated to the 450° F point, the water trapped inside the kernel reaches a boiling point and, applying basic physics, changes to steam that expands inside the hard outer shell.

The outer shell cannot withstand all the internal pressure, explodes to release the steam and turns inside out. The starches that were stored inside the seed kernel to feed the new popcorn plant are exposed and instantly cook into popped popcorn. At the same, the steam wafts away, bringing to our senses that delicate and ever so tempting aroma of freshly popped popcorn!

Name: _____ Date: _____

Multiple Choice Questions

Circle the correct answer.

1. How much popped popcorn does the average American eat each year?
 - a. 10 quarts
 - b. 20 quarts
 - c. 30 quarts
 - d. More than 30 quarts

2. Besides microwave popcorn, Americans like to make popcorn
 - a. On the stove
 - b. In the fireplace
 - c. At a campfire
 - d. All of the above

3. A popcorn kernel is
 - a. The seed for a corn plant
 - b. The seed for a popcorn plant
 - c. Soft like sweet corn
 - d. None of the above

4. The key to good popcorn is
 - a. Using a microwave with a "Popcorn" setting
 - b. Using an old-fashioned popcorn popper
 - c. The moisture content of the popcorn kernels
 - d. All of the above

5. What approximate temperature is needed to make a popcorn kernel explode into popcorn?
 - a. 450° F
 - b. 350° F
 - c. 212° F
 - d. 200° F

6. The fluffy white substance of popcorn is
 - a. Starch
 - b. Protein
 - c. Fat
 - d. Vitamins and minerals

Name: _____ Date: _____

Short Answer Questions

1. How many quarts of popped popcorn does the average American eat away from home, for example at the movies and sporting events?
2. Besides using a microwave oven, how else can you make popcorn?
3. Explain why the moisture content of the popcorn kernel is important to popping popcorn.
4. What is the role of steam in making popcorn?
5. Where does the aroma of freshly popped popcorn come from?
6. Is popcorn the same as the sweet corn you eat on the cob? Look up which states grow popcorn.

Answer Key

Multiple Choice

1. d.
2. d.
3. b.
4. c.
5. c.
6. a.

Short Answer

1. The average American eats about 54 to 70 quarts of popped popcorn per year, 30% away from home.

$$54 \text{ quarts} * 30\% = 54 \text{ quarts} * .3 = 16.2 \text{ quarts}$$

$$70 \text{ quarts} * 30\% = 70 \text{ quarts} * .3 = 21 \text{ quarts}$$

The average American eats about 16 to 21 quarts of popped popcorn away from home.

2. It's also easy to make popcorn on the stove using a deep pan and specialty stores still sell old-fashioned popcorn poppers for use over an open fire.
3. The reason that the moisture content of popcorn is so important is that the water stored inside the popcorn kernel is the propellant, so to speak, behind the final explosion that turns the hard kernel into popped popcorn.
4. As the un-popped kernel is heated to the 450° F point, the water trapped inside the kernel reaches a boiling point and, applying basic physics, changes to steam that expands inside the hard outer shell. The outer shell cannot withstand all the internal pressure, explodes to release the steam and turns inside out. The starches that were stored inside the seed kernel to feed the new popcorn plant are exposed and instantly cook into popped popcorn.
5. The steam needed to pop popcorn dissipates, carrying the aroma of popped popcorn.
6. Popcorn is a different type of corn than sweet corn. Most of the world's popcorn is grown in the United States corn belt of Iowa, Illinois, Indiana, Kansas, Kentucky, Michigan, Missouri, Nebraska and Ohio.