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How Popcorn Pops

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Popcorn has been a popular snack for thousands of years. Remnants of the tasty treat have been found in Mexico dating back to 3600 BC. Popcorn pops because each popcorn kernel is special. Here's a look at what makes popcorn different from other seeds and how popcorn pops.

Why It Pops

Popcorn kernels contain oil and water with starch, surrounded by a hard and strong outer coating. When popcorn is heated, the water inside the kernel tries to expand into steam, but it cannot escape through the seed coat (the popcorn hull or pericarp). The hot oil and steam gelatinizes the starch inside the popcorn kernel, making it softer and more pliable.

When the popcorn reaches a temperature of 180 C (356 F), the pressure inside the kernel is around 135 psi (930 kPa), which is sufficient pressure to rupture the popcorn hull, essentially turning the kernel inside-out. The pressure inside the kernel is released very quickly, expanding the proteins and starch inside the popcorn kernel into a foam, which cools and sets into the familiar popcorn puff. A popped piece of corn is about 20 to 50 times larger than the original kernel.

If popcorn is heated too slowly, it won't pop because steam leaks out of the tender tip of the kernel. If popcorn is heated too quickly, it will pop, but the center of each kernel will be hard because the starch hasn't had time to gelatinize and form a foam.

How Microwave Popcorn Works

popcorn presents a health risk not encountered with regular popcorn because the flavorings are also affected by the microwave and get into the air.

Does all corn pop?

Popcorn that you buy at the store or grow as popcorn for a garden is a special variety of corn. The commonly cultivated strain is *Zea mays everta*, which is a type of flint corn. Some wild or heritage strains of corn will also pop. The most common types of popcorn have white or yellow pearl-type kernels, although white, yellow, mauve, red, purple, and variegated colors are available in both pearl and rice shapes. Even the right strain of corn won't pop unless its moisture content has a moisture content around 14 to 15%. Freshly harvested corn pops, but the resulting popcorn will be chewy and dense.

Sweet Corn and Field Corn

Two other common types of corn are sweet corn and field corn. If these types of corn are dried so they have the right moisture content, a small number of kernels will pop. However, the corn that pops won't be as fluffy as regular popcorn and will have a different flavor. Attempting to pop field corn using oil is more likely to produce a snack more like Corn Nuts, where the corn kernels expand but don't break apart.

Do other grains pop?

Popcorn is not the only grain that pops! Sorghum, quinoa, millet, and amaranth grain all puff up when heated as the pressure from expanding steam breaks open the seed coat.