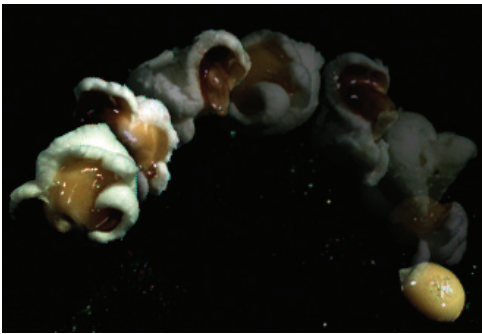
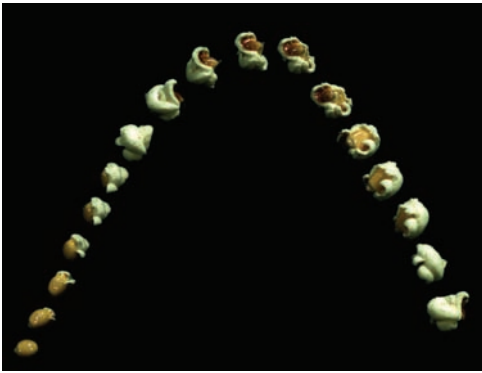


Food Science:

Real Life Drama in the Kitchen



We love popcorn for so many reasons. It's a whole-grain, naturally low in fat and calories, and adds fiber to the diet. It smells and tastes great and offers versatility whether you're craving something salty or sweet. But popcorn also can boast a unique talent in the food world: its ability to pop.

Half the fun of popcorn is watching it turn from a hard, little yellow seed into a white fluffy treat. Few foods take such a dramatic turn as popcorn does while it's cooking. Standing in the kitchen waiting for your popcorn to finish, an awesome spectacle is unfolding before you.

People have been fascinated by popcorn for centuries. Early Native Americans believed a spirit lived inside each kernel of popcorn. When heated, the spirit grew angry, burst out of its home, and fled into the air as a disgruntled puff of steam. A less charming but more scientific explanation exists for why popcorn pops.

Popcorn is a whole grain. It is made up of three components: the germ, endosperm, and pericarp (also known as hull). Of the 4 most common types of corn—sweet, dent, flint, and popcorn—only popcorn pops. Popcorn differs from other types of corn in that its hull has just the right thickness to allow it to (eventually) 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.

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 superheated gelatinous substance. 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 single kernel can swell to 40-50 times its original size!

To see this transformation in super slow motion (captured between 13,000 and 15,000 frames per second), visit the Popcorn Board's web site (www.popcorn.org) under the "Encyclopedia Popcornica" or "Teachers" sections.

