Pizza & Steel

LATELY, I'VE BEEN having fun learning to make my own pizza dough and refining my technique. This started a couple of months ago when the LA Times published an article on New York-style pizza and, for a change, included not just recipes, but how to combine the ingredients—which made a big difference to the mess I'd make in the kitchen and also to the final result. It's now quick and neat.

Getting the yeast to rise has always been the hardest part of any breadmaking endeavor at our house, but I finally realized that hardcore gearheads may already own the perfect tool: a non-contact infrared digital thermometer like you'd use to diagnose a radiator for blockage. Because yeast is supposed to be added to sweetened water between 105°–115° F (hot enough to grow without killing it), and a temperature you'd never get right without some kind of thermometer, using this gun I can pour the yeast on the water at precisely 115° and within 10 minutes, have a perfect bloom of yeast that never fails to make the flour rise.

Here's the plan if you like good pizza as much as I do: Use two bowls, one big, one medium. In the medium bowl: Mix 2 cups fresh all-purpose flour with 1 teaspoon of salt. Large Bowl: Mix 7/8 cup very hot water with 2 tablespoons of the flour mix and dissolve in 1 teaspoon of sugar. When it cools to 115°, pour 1/2 package of Fleischmann's dry yeast on top and wait 10 minutes for a thin foamy head to form. Next, wisk 1.5 tablespoons of olive oil into the yeast mix, wipe the insides of the bowl with a bit more oil to keep the dough from sticking, and start wisking in the flour/salt mix. You should be able to wisk the mix until the last bit, when it gets too sticky. Do the rest by hand. Dust a bit of flour on top, squeeze it a bit to get a uniform texture, and make a smooth ball. Next, clean the medium bowl, wipe it inside with oil, plop the dough ball inside and cover the bowl with plastic film. Then clean the large bowl, put about a cup of hot tap water in the bottom and set the medium bowl inside to act as a warmer. About three hours later, the dough will be tripled in size and you can either dust some flour on the counter and make your pizza pie or save it in the fridge overnight for use the next day. If you store it, let it warm to room temperature before forming, and you'll find the dough has a wonderful elastic texture that's perfect for shaping. Cook the pie by itself (no toppings) for about 12-15 minutes or until it's just starting to brown in an oven preheated to 425°. I use a large perforated aluminum pizza pan wiped with olive oil set on a hot

round pizza stone. (You can also use the heat gun to double-check the oven temp.) Remove, brush the rustic bread pie with olive oil to keep the sauce from making the dough mushy and add whatever toppings you like. Return to the oven for another 12-15 minutes, remove and eat to rave reviews.

All this might seem an odd (but tasty) digression for a column, but there is a connection: The transformation that yeast creates, to make flour into delicious bread, is thought to be the inspiration behind both chemistry and metallurgy.

The oldest records of bread making, seen in Egyptian hieroglyphics, are approximately 5000 years old, indicating that these activities were being pursued around the same time. In fact, the early metalworkers were much like early bakers, utilizing secret family recipes and tending ovens of their own design passed down through generations. Also, the technique of using yeasts to ferment fruits and grains to create alcoholic beverages is another major part of this early skill with chemistry. And because beer-making was once the only reliable source of baking yeast, old cookbooks contained information on both how to brew beer and bake bread, so it's likely a good brewer was probably also a good baker and maybe related to the blacksmith.

Although we are taught to imagine our human ancestors as hairy brutes gathering around fires that were luckily maintained after being "magically" created by lightning, the techniques of transformation by heat have been very sophisticated for many thousands of years. Early blacksmiths could identify the precise temperatures for various operations by the color of the heated metal and the metallurgical skills of early sword and knifemakers are still held in awe today.

And don't forget that this was all done without a modern scientific understanding of how it worked. For instance, how yeast actually made bread rise was not definitively known until its "discovery" by Louis Pasteur just 150 years ago. Prior to this time, it was thought that yeast was a form of chemical catalyst, not a living microorganism that breaks down the starches in flour, making carbon dioxide which reacts with the gluten proteins and causes the dough to expand. It was such a mystery that yeast was known as "goddisgoode" in 15th century England—a true miracle. If you've ever enjoyed great bread fresh from the oven, you can't disagree. And if you ever tried to make bread with dead yeast that wouldn't bloom, you can appreciate that unleavened bread has a texture that makes drywall look appetizing.

Historically, the "Iron Age" which began around 2600–3200 years ago, marks iron's ascendancy as the primary metal for tool production. The so-called "Stone Age" ended with mankind's first metal production, now called the "Bronze Age," which is considered to have begun around 5000–5300 B.C. Bronze is a mixture of mainly copper with a small amount of tin added (about 11%). Copper melts at about 1850° F, and tin at about 500° F, but cast iron requires about 2500° F.

Iron is now by far the most important metal on the planet with a global production of over a billion tons per year. What we call steel is essentially iron that has been heat-treated to reduce its carbon content mixed with a small percentage of certain hardening agents—chrome, nickel, manganese and vanadium being the most popular—to create specific desirable properties.

The heat needed for the production of iron and steel created deforestation on a vast scale in earlier times, but by the time Sheffield, England, had become the world's largest producer, coal (cheap and dirty) had become the primary source of this heat. A century ago, the US was the biggest producer, supplying 30% of the world's steel, but China is currently the largest.

Recycling recovers only about 43% of annual world production, but saves about 75% of the cost of production from raw ore.

The message: Pizza is very good, but recycling steel is very important!

Dave Searle

—Dave Searle
Editor