

Growing bread yeast.

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Ever since learning to make bread, I have a growing fascination of what makes leavened bread “Be”. Four items are needed to make leavened bread:

- Wheat flour
- Liquid
- Leavening
- Salt

Remove any one of those or experiment with the percentages of any one too much... well you WILL get bread, but most likely not what you were wanting.

What I want to look at here is the last item, leavening. I also want to narrow that down further to what we have available in convenient packets -- Dried yeast -- Bread yeast.

What are yeasts?

Yeast are unicellular fungi. The precise classification is a field that uses the characteristics of the cell, ascospore and colony. Physiological characteristics are also used to identify species. One of the more well known characteristics is the ability to ferment sugars for the production of ethanol. Budding yeasts are true fungi of the phylum Ascomycetes, class Saccharomycetes (also called Hemiascomycetes). The true yeasts are separated into one main order Saccharomycetales.¹

Saccharomyces cerevisiae is a species of budding yeast. It is perhaps the most important yeast thanks to its use since ancient times in baking and brewing. It is believed that it was originally isolated from the skins of grapes (one can see the yeast as a component of the thin white film on the skins of some dark-colored fruits such as plums; it exists among the waxes of the cuticle). "Saccharomyces" derives from Greek, and means "sugar mold". "Cerevisiae" comes from Latin, and means "of beer". Other names for the organism are:

- *Brewer's yeast*
- *Ale yeast*
- *Top-fermenting yeast*
- *Baker's yeast*
- *Budding yeast²*

“It is believed that it was originally isolated from the skins of grapes”, that “one can see the yeast as a component of the thin white film on the skins of some dark-colored fruits such as plums”. At this I started looking around when shopping in the produce section of my local market. I find that it is on more than just fruits, one can see it on cabbages, broccoli, plums, grapes, leafy greens and blue berries to name a few.

I then started stumbling across other references *Prehistoric Cooking*, by Jacqui Wood. “*The acquisition of yeast for prehistoric peoples revolved around a yearly cycle. This was also so for many aspects of their lives, following the seasons and festivals. The yearly yeast cycle for bread-making is totally reliant on wine and beer production*”. She also states, on the same page, that “*The start of the Celtic New Year also coincides with the ripening of the elderberry and the making of Elderberry wine. The fruit is one of the richest natural sources of wild yeast in northern Europe.*”³

“Palladius' treatise on gardening and associated skills. Translated in about 1420 into English and at the time of publication (1870) resided in Colchester Castle.

A galon muste from under feet do to a strike floure of newe wheete, and let it drie in sonne, and weete it oft & drie it do yit ofte; the same in smallest loues plie and drie it harde in sonne; in pottes trie now gipse it fast; and use this ferment for musty brede, whom this wol condyment.

Notes: Add to a gallon of trodden must a strike of new wheat flour, dry it in the sun, wet it and dry again. Roll into small lumps and dry in the sun, and plaster up in pots to make new bread whenever you require it.”⁴

Another reference came from *The Natural History*, by Pliny the Elder. “Millet is more particularly employed for making leaven; and if kneaded with must, it will keep a whole year. The same is done, too, with the fine wheat-bran of the best quality; it is kneaded with white must three days old, and then dried in the sun, after which it is made into small cakes” and in the same chapter “These kinds of leaven, however, can only be made at the time of vintage”⁵.

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I took this information as my starting ground for growing my own bread yeast - Wild *S. cerevisiae*.

Items used:

2 quart glass bowl

Metal conical sieve

Wooden ram

Ceramic crock with lid

Unleavened dough

Millet flour

All purpose flour

Wheat Flour

Spelt flour

Rye flour

Honey

Spring water

Black grapes with white power of yeast

Wooden spoon

Mortar and pestle

Process:

Scalded all tools to sterilize.

Forced about 3 cups of the grapes through sieve with the ram and poured them into the mixing bowl, leaving this to sit for a day covered in tight linen cloth, allowing for oxygen to circulate.

That evening I skimmed off the slight foam, what parts of the grape skins were still floating and about a cup of the liquid and poured that into my crock. To this I added enough millet flour until it was moistened through and held its shape. The crock lid was then sealed with ribbon of unleavened dough and set to the side in the kitchen for a week.

I did check every few days noting smell and appearance.

Day Two: Bubbles began appearing on the mix it was then stirred and resealed. The smell at this point was slightly fruity.

Day Four: The bubbles had returned, and stirred down again, now the smell was akin to fruity wine in early stages. From my experiences with sourdough I will assume that this was still going properly. Side note, when sourdough goes orange, and /or starts smelling like cheese, throw it out and sterilize everything.

Day Eight: I had left the must and millet flour mixture alone for 4 days sealed under in the crock. The surface became slightly watery with a film of white across the top again the smell was more like fermenting wine so I assumed it was still good.

Nearly a month later: The mixture has dried some, the smell is still vaguely. The CO₂ build up makes it a bit dangerous to put your face in the pot and inhale. Appearance-wise, light purple-gray.

Now to try it again to see if it will still leaven dough.

I had made bread before at day 8 and it was quite a good success. Unfortunately the original bread did not survive, due to neighboring squirrels, spouse and time. Since I was given the opportunity to do this again I have been able to extend the test. So a new loaf of bread was baked for this entry.

Pliny explains in one case how the yeast was restarted “*When required for making bread, these cakes are first soaked in water; and then boiled with the finest spelt flour; after which the whole is mixed up with the meal; and it is generally thought that this is the best method of making bread. The Greeks have established a rule that for a modius of meal eight ounces of leaven is enough.*”⁵

*Modius (n.) A dry measure, containing about a peck.*⁶

*Peck (n.) The fourth part of a bushel; a dry measure of eight quarts; as, a peck of wheat.*⁷

8 quarts of whole meal flour is about 8.47 lbs⁸ (8 lbs 7.52 ounces)

1 quart of flour is about 1 Lb 1 oz

Therefore....

1 ounce of leaven for each 1 Lb 1 oz of whole meal flour

Boiling refers to the bubbling action going on, I did not actually heat the yeast to 212°F, because yeast begins to die at 120°F. Pliny refers to making a starter from the yeast and spelt flour, thus proofing the yeast to make sure it is good. Then one can go ahead and make the dough after the starter is going good.

Starter:

1 ounce dried leaven taken from the sides of the crock and ground in the Mortar and pestle

1/2 C. spring water

2 1/2 ounce Spelt flour

Dough

14 ounces all-purpose flour

1 ounce Spelt flour

1 ounce Rye flour

Starter as previously made

1 1/4 teaspoons salt

1 1/4 C. water

1 Tb Honey

Millet flour for dusting

Period bread recipes are vague and very few exist if they were ever written at all. This one published in 1475, written by Platina offers such guidance in the preparation of bread “*Anyone, therefore, who does baking should use flour which is well-ground from wheat... from this, he should separate the bran and the inferior flour with a very fine flour sieve, then put the flour; with warm water and some salt, on a baker's table closed in at the sides, as the people at Ferrara in Italy are accustomed to do. If you live in damp places and a bit of leaven is used, [the baker], with help from his associates, kneads to that consistency at which bread can be made fairly easily. Let the baker be careful not to put in too much or too little leaven, for, from the former, bread can acquire a sour taste, and, from the latter, it can become too heavy to digest and too unhealthy, since it binds the bowels. Bread should be well-baked in an oven and not used the same day, nor is it especially nourishing when made from very fresh wheat and if it is digested slowly.*”⁹

I intentionally do not include the full recipe as that is not the focus of this entry.

I did add the honey as additional nourishment to the yeast and sweeten the bread. The rye and spelt were added for color, grain variety and flavor the the all purpose flour, all of which was sifted prior to use. I did use All-purpose flour for two reasons, one it is what I have and two it is also lower in protein. Not the same protein strengths nor ash levels of European flour, but not a high protein winter wheat that thrive so well in New World in places like Montana.. Bottled spring water was used to keep the chlorination from killing any of my yeast. I used a large ceramic bowl to mix and rise the dough in as I currently do not have room for nor own a dough trough

Results:

The dough has reacted as I had hoped, doubling in size before baking.

The bread is edible! It shows existence of gas production by rising.

By making a second loaf it is repeatable, even after the yeast has been simply left alone for a month.

I expect next week I will be using this yeast to make one if not two varieties of bread for an event luncheon.

I have provided a sample of the bread and a few items used in this process. Most importantly the grapes, so one can see the yeast on the skins.

Conclusion:

Egyptians are thought to have been using yeast in brewing, vintning and baking 2000 years before Pliny's observations in his book published in 77 AD. About 1200 years before that the ancient Celts were using elderberries for vintning and baking. These are not new techniques but yeast is still produced today by culturing.

In a 1997 article/email on the SCA Cooks list Katerine Rountre (Terry Nutter) shows a number of instances that people in period knew of yeast and its difference from sourdough.

"The earliest evidence I am aware of in the recipe corpus for a direct recognition of yeast occurs in a late 13th century Anglo-Norman collection (B.L. MS Additional 32085), recipe number 4 in which ("Mincebek") includes the ingredients "un poi de gest ou un poi de past egre", that is, "a little yeast or a little sourdough". In the 14th century, two recipes from Forme of Cury (number 154, "Frytour of pasternakes, of skirwittes, & of apples", and number 156, "Frytour of erbes") call for "ale & 3est" and "a lytel 3est" respectively."*¹⁰

*"From one tiny yeast cell, tons of yeast can be produced."*¹¹ Fleischmann's Yeast today still separates out one yeast cell of *S. cerevisiae* and then cultures it up to tons of yeast in huge vats. *"It was Louis Pasteur In 1859 who first discovered how yeast works"*.¹¹ Once made it is processed, dried and crumbled into the packets we are familiar with today. It is stronger in producing the results we are used in leavened bread, but it is also of a specific strain of *S. cerevisiae* that thrives to produce the CO₂ needed for bread baking.

From humble fruit skins one can make yeast, if I was so inclined and had the understanding I might even make beer or wine from the same starting point. Being able to create this yeast allowed the household to function providing these day to day necessities. By using the grapes from the harvest one started a new batch each year that had been stretched thin over the previous 12 months. Refreshing the flavors from yeast strains that may have gone a little off track.

It is not a fast process to get started nor is it as consistent as modern day baking yeast. One has to spend more time feeling and hoping the process will work. Relying on mystery and faith, a sense of wonder and uncertainty, not knowing if it will produce well in the final result. Whether you will have leavened bread and not another day of pita, each and every time the uncertainty exists whether or not the starter will thrive -- Living in the moment and adapting to the results

One latest bit of information I turned up during the research was the fact that the century old vineyards have well established yeast strains”

“In European vineyards, many areas have been growing grapes and making wine for centuries — in some cases for thousands of years, in the same areas, on the same land. When fermentations were finished and the grapes were pressed, they didn’t take them to the garbage dump (there being no such thing). Instead the grape skins, pulp and yeast were composted and returned to the vineyards as fertilizer.

Over time, the yeast that were able to breed fastest and ferment the most alcohol tended to prosper, so they were the ones that got returned to the vineyard. After a few generations of this type of selection, the vineyards would be saturated with a strong culture of well-adapted yeast and the cycle would continue.

In North America, vinifera grapes were not successfully planted in any quantity until the 19th Century, so the yeast found here have not had the millennia of adaptation seen in European vineyards. When yeast companies and biologists go looking for new strains of yeast that deliver the flavor profile associated with a specific wine region, they travel right into that region and sample the local vineyards and wineries, culturing the yeast cells found in the area to make up their little packets of beige powder.

It is indeed possible to allow an indigenous yeast fermentation with North American grapes, but the results are not necessarily predictable. Typically, spontaneous fermentations proceed slower and the wine may not reach dryness. Such fermentations may require a lot more intervention than they would if the winemaker had chosen to sprinkle a packet of cultured yeast.”¹²

This may be problematic in reproducing specific yeast cultures for baking or even loftier heights of ale and wine making. But as I have found the yeast can be cultured and used – consistency.. well that is another matter.

As Father Dominique often says, "It's bread, it will forgive you."

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