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## Good to the Last Drop and Crumb: Better Living Through Yeast Byproducts

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**GOOD TO THE LAST DROP AND CRUMB**

**Better Living Through Yeast Byproducts**

A crisp pilsner beer, still dripping from its icy spot in the cooler, complements any sunny summer barbecue, while in the winter a rich burgundy warms the throat and soul, a perfect fireside companion. The mothers who frequent the Wonder bread discount outlet demonstrate to what extent our hectic society takes the staff of life for granted. It is difficult to imagine them actually baking every loaf, roll, bun, and donut that they toss into their carts while herding rambunctious broods down the narrow aisles. Rarely does anyone give a second thought to these ancient components of civilized life beyond slapping another slice in the toaster or agonizing over which beverage correctly accompanies the main course when guests come for dinner. They spend even less time thinking about the tiny fungus that toils mysteriously without oxygen or light to produce these staples of daily life. Without the yeasts, close relatives of the mold family, there would be no alcohol, drinkable or industrial, our staff of life would most closely resemble saltines, and the world at large would suffer losses more significant than these self centered examples from a human perspective.

My interest in the relationship between man and yeast began in a roundabout way when I first encountered "real" beer. "What exactly is this" I wondered silently as the barmaid topped off the pitcher with a jet black liquid and thick, creamy brown froth.

"Terminator Stout, my friend Pat announced, "the strongest beer they have in here." Heavy almost to the point of syrup, it had an intense flavor of dark, roasted grains. It tasted like cold, carbonated espresso beer and I could feel the warming glow of the wine like alcohol content after one swallow. Nothing in my short, miserable existence had prepared me for that.

I had never really liked beer that much and made fun of my youthful friends while they choked down their thin, sour six packs. I looked down my nose and upturned bottle of T.J. Swann's or Gallo wine at them. In my naive mind these classy beverages put me at least one step up the social scale from them, besides providing more alcohol for every dollar invested. The beer available to us most closely resembled colored water in its chemical composition and left a person hyperhydrated, not drunk.

I heard over and over again the line that is usually reserved for reluctant girls. I mean in regards to drinking beer, not the other reluctance that teen age boys scheme with completely dedicated minds and bodies to overcome. "You just need to develop a taste for it," they would pronounce authoritatively from

a rosy stupor.

"A tolerance for the taste is more like it," I shot back and the conversation usually degenerated from that sophisticated level to a fist fight in a matter of minutes.

This limited exposure had not prepared me for the Summer Raspberry Wheat either. The ruddy pink color in the glass warned me to approach this so called "beer" with caution. Any doubts I had turned rapidly to love when the smell of raspberry and rich malted grain, like fresh made bread, hit my senses before I tasted anything. Then the taste, too rich and too sweet to be beer, but some magical, honey berry nectar. From that swallow on I was hooked. This passion goes beyond simply consuming beer and an occasional bottle of cheap wine, to an interest in the production process itself. This is where I took a wider view of yeast than simply lab cultures or the colonies inhabiting my old sneakers.

These microscopic, single-celled creatures live in almost all aspects of the environment. Many types have specific habitats in the soil, on trees, inside animals and insects, or on fruits, milk products and other foods. As true members of the fungi family they do not produce their own energy like plants do, but depend on an external food source. They generally reproduce by budding, although some species also produce spores as a survival mechanism during unfavorable conditions. A small swelling of cell material grows larger and breaks off from the parent cell at maturity. Bakers' yeast cells reach maturity and begin budding within 30 minutes and many older cells (relatively speaking) carry 20 to 40 bud scars along with their own "belly button" birth scar.

The yeasts used by man to make beer, wine, and bread all belong to the single genus *Saccharomyces*. Bakers and brewers both use forms of *S. cerevesiae* and brewers also use the species *S. uvarum*. Commercial yeasts are produced as pure cultures by isolating a single desirable cell and growing it in a sterile medium. The culture is introduced to larger and larger batches of the medium that often exceed 100,000 gallons on completion. The yeast is then separated out for use or packaging.

Bread making involves fermentation of the sugars and starches in the dough to produce alcohol and carbon dioxide. The rising action of the bread comes from escaping gas creating bubbles, holes, and tiny trails in the thick dough. In contrast to the generally held conception of fermentation processes, alcohol is an undesirable by-product that evaporates completely during baking. This leaves the sponge like

loaf, lightened and puffed out with millions of microscopic hollows as the only evidence of the yeasts' brief, but intense workmanship.

The subject of beer or wine conjures images of amber waves of grain and pungent, spicy hops or grape clusters hanging, ponderous and juicy in the twilight chill of autumn, waiting for the harvest peak. But after humans have done the mixing, matching and final adjustment of ingredients they turn the liquid over to the single-celled laborers to perform the magic of fermentation. The yeast have the final say in whether it turns into a noble Cabernet or gallons and gallons of vinegar.

The metabolic activity of yeast produces not only carbon dioxide, water, and alcohol, but also many of the flavor characteristics that make up these beverages. Esters result during fermentation from various combinations of an alcohol with an acid, which create some of the chemicals present in the flavor and aroma profiles. These esters contribute strawberry, apple, banana, grapefruit, or raspberry qualities to the beverage. Another characteristic produced by yeast activity is a butterscotch or perfume-sweet honey flavor called diacetyl. These characteristics sound foreign to the concept of beer in America with its very light, dry taste. It depends on the *S. uvarum* yeast strain which ferments at colder temperatures and produces fewer flavoring by-products. The technology of microbiology and refrigeration have made this cleaner, crisp style a recent arrival on the fermentation scene.

After the yeasts have depleted the sugar supply in their environment they settle out of the beer or wine and enter a dormant state. They reawaken from this hibernation when they come across a sufficient new food source and pick up their life cycle where it left off. The recent discovery of a shipment of porter from 1868 demonstrates the resiliency of these creatures. Scientists opened the bottles and discovered unpalatable beer, and some live cultures since the brews had never been pasteurized. They developed a workable culture and the Guinness brewery has even used it to market an authentic "old English" ale.

Yeast has labored for man in anonymity for generations and today only lab technicians and consumers of homemade bread or brew appreciate its efforts. Every toast we raise and every sandwich we eat should remind us in a small way what a debt we owe to the harnessed life cycle of this humble fungus.

## THE PATRIARCH

"Ahh shit, said Alison as she stepped out of the car, stretching her foot to miss the scattered sheep pellets in the dirt at the side just below the door. Teddy stretched and groaned in mock agony at the snap, crackle, and popping sounds in his joints, "Yup, we're over on the ranch now, time to step lightly" he said. He watched the dust from their last mile on the dirt lane ghost off over the field and disappear then he turned to count the cars in front of the small house.

"Quite a crowd today. The whole fam damily's here," he said walking up the driveway where they were assaulted by two shaggy, slobbering sheep dogs. "Go find some lambs to eat," he yelled petting them and brushing aside the persistent jumps and forceful nuzzles, "that or some little kids. No one would miss one or two." They turned to go in just as the door smashed shut behind two children who tore past them into the yard. The first one laughing, sprinting by, pursued by the second, smaller one with murder and tears in his eyes.

The house was packed like a bus at rush hour with one layer of adults and a second layer of smaller bodies at waist height, weaving between the tangle of grownup legs. He scanned the crowd, nodding to cousins, older folks, and people he didn't know at all, who smiled and waved at him. He worked his way over to the chair where his grandma sat leaning forward with her cane resting between her knees. He bent down to kiss her hello. "And don't you go outside without a coat and something on your head," she was yelling after a departing youngster. "Henry!" she directed her voice to the next room, "find this child a warm shirt so he can go outside. Henry! That man always disappears right when you need him."

Ted began telling her about his classes and trying to sound excited when grandpa shuffled through the crowd and up to them. He was dressed in comfortably mismatched plaid pants and a worn flannel shirt with traces of shaving cream behind his ears and filling deeper creases high on his cheek.

"What was that dear?" he bent down with a hand on the arm of the chair and the other cupped to his ear.

"I wanted you to find an old shirt for Ben to wear outside, but he's gone now. What are you doing standing around over in the kitchen?"

"I'm getting the whiskers off my face while there's no one in the bathroom and then-"

She rushed on not waiting or wanting to hear excuses. "Well you should get out here in the kitchen and help get dinner so we can eat before these kids fill up on chips or run off and get lost. You are always doing the wrong thing at the wrong time, now find those three folding chairs in the bedroom and the one from upstairs. But first get the butter for Joan, she didn't see it in the fridge." Henry began moving slowly off toward the bathroom, stopping to get the butter dish down from the cupboard for Aunt Joan.

Despite the chaos, dinner was a spectacular event. Ted sat back stuffed and sluggish, feeling like a snake that has swallowed a bowling ball. The children slipped outside and the old house sighed thankfully under the weight of single feet when Henry moved the melting ice cream back to the freezer and covered the pies. He glanced at the clock and said, "I'd better feed the lambs now. They've been waiting all afternoon." He set the bucket full of milk bottles on the counter by the sink and then went searching for the powdered milk mix in the newly rearranged disaster area of a kitchen.

Henry, come here a minute" grandma called after his retreating form. "I know you can hear me so just leave the lamb feed alone and come here."

In the kitchen Aunt Joan helpfully raised her voice and relayed the command, "Grandpa, grandma is calling you."

"I know, I'll be right there," as he moved off into the next room.

Grandpa returned a moment later, set the sack of dry milk in the kitchen and sat back down next to grandma. "Now dear, what is it that you wanted?" he asked resting his arms on the arm of her chair and leaning forward with an exaggerated air of concern.

"Didn't you hear me call you? You always go off farting around when there's work to be done. Can't you see that the table and kitchen need to be cleaned up." Grandma's scolding wore on and grandpa looked up, rising to his feet. As he stood up he turned to give Ted and the other end of the table a long, slow wink before bending down again and agreeing to do the dishes up. The sound of the glasses and silver jostling triggered some deep seated "tidy" instinct in the women present. In unison they rose and began helping clear the dirty dishes off the table.

"You come back and sit down" grandma said sternly, "After you went to all the work making the dinner Henry and I can do the dishes." A vigorous chorus of protests sprang back from everyone around the table. Uncle Pete even raised his head from the back of the couch to chip in "let those younger girls do it Grandma. You just relax", and then took his own advice and began snoring again. Henry moved the bottles to a corner on the floor when the dishes began piling in several leaning towers in and around the sink. He helped reorder the kitchen until the crowding of helpers posed a traffic hazard and then went to join Pete on the sofa. Ted helped put the dishes away, leaving the obscure implements to be hidden according to his grandparents' mysterious system.

The families left one by one as the shadows spread to fill the yard, the valley, and then darkened the sky. They had gone out to indulge in a round of goodbyes, but Ted caught fragmented pieces of the lecture his grandma was giving. "Henry why do you always wait til dark before you get around to the chores. Damn it, I think you know how much I worry about you puttering around after dark. Now there are no excuses, if you just started earlier than you could be done and in the house before that."

Back in the house Alison laughed with some straggling cousins and Ted ran down to the corral to help grandpa with the chores. He found him in the bum lambs' pen, those animals that had lost their mothers and had to be fed milk from a bottle. Henry held a bottle for one lamb and fended the rest of the hungry bunch off with a soft, bony hand. "Quit pushing now Blackie," he said to an especially greedy and large black faced fellow. Ted took two bottles and caught a lamb on the end of each one. Using the system he had developed when this had been his job he used his foot to hold the rest at bay or smack any that proved too persistent. They led the fed lambs to the chicken coop in the pen and shut them inside to keep them separate. Ted actually enjoyed the calm, standing in the dim pen listening to the chickens muttering, upset at being disturbed so late and the tree scratching on the roof in the wind.

Grandpa told Ted the story for each lamb in the pen, when they had been born or found and the circumstances for their orphaned state. "Sometimes having the chores to do is the main thing that keeps me going. I'm convinced that keeping active even if it's just doing a little bit every day is one secret to getting this old. Even days when I don't want to get up I think about these little critters down here and just have to come feed and check on them. Besides that, doing the chores gets me out of the house for a

while every day," he added, punctuating it with a wink.

"I think I'd want to stay outside as long as possible," Ted paused, not sure how much further to pursue the matter and then glancing up, not sure whether the bent figure had even heard.

Suddenly the lambs inside the coop discovered that grandpa had not shut the door tightly enough to latch. They burst forth into the pen in a wooly flurry. "Grandpa" shouted Ted with a sinking feeling at the thought of trying to separate the groups again or of mixing another batch to make sure none got passed over.

"What was that?" grandpa said loudly as the frisky herd crowded around the feeders. Uncle Pete would have been cursing himself hoarse and smacking the sheep back into the doorway, but grandpa continued feeding his immediate charge and smiling at the rambunctious babies. "Don't worry about them, only Pinky, Tiny, Mr Bill, and Albert still need to be fed", he said picking out the four creatures from the mass of backs and ears. "Then we'll give the extra to Blackie and her friend. They need the food and they start to get pushy when they want some extra attention. Don't worry about me either. I hear and do most of what I want to and your grandma just has her own way of showing that she cares, and asking for a little attention too.

## POETRY

### Down and Out

Empty thoughts strung out behind

Like spider webs of glass,

I can't think and I don't feel

Life's current sweep on past.

A chip flung on the high seas,

Leaving lost tracks in the land of little rain.

A flame quivers in the hollow of my cupped hands

Light dances off the chapel walls of reflecting hands

and I bend my face close

to blow it softly,

softly to life.

On the inherent Good of Growth and Progress

A fence abruptly cut the trail where I had ridden since childhood

The chain link barrier stretched tight  
across the path imaginary Indians followed,  
single file intently at play.

The same trail that the map showed  
leading to untold pirate wealth or distant, mysterious galaxies.

Later, chasing roller coaster thrills down the steepest trail,  
I screamed through the flashing tight turn at the bottom of the hill  
and rocketed straight up the other side.

The only physics activity I've ever smiled through  
transforming the energy of a downward hurtle  
into upward power that could almost tear through earth's gravity.

Why fence, why even build on this burned brown grass hillside  
where I wandered to escape for a moment the "quiet desperation"  
bottled up in the twinkling lights of houses below.

No spectacular scenery here,  
just a quiet distance from the life spent asleep in the blue television glow  
or blinded by rushing headlights.

Now divided and soon to be conquered by a suburban sprawl.

No haphazard construction,  
my stomach dropped and surprise turned sick and angry  
at the metal mesh so far up the mountain.

And people complain

about the deer moving down into **their** yards every winter,  
into **their** streets.

### GrandMother

She once gave a persistent neighbor

her recipe for perfect apple pie.

"Really very simple,"

she said of her subtle flavoring and touch of spice,

then left out several key ingredients

the way the gods might grant eternal life

and omit youth.

But I was surprised and a little hurt

when the double Dutch chocolate cookies

I loved so much as a child

came from the oven dry

and tasteless as newsprint.

Though she swore

she told me everything,

I knew it wasn't true.

She said "It could be your oven".

Then mailed a box of lemon cups

that even after three days in the truck

tasted better than my failed ones.

### Photo Magic and the Camera Eye

I found a picture of us on the beach

three stooges in the sun.

Gotta smile 'cause we were so crazy, so young.

But the tiered faces of other creased, soft-edged snapshots

didn't show in their sitting, kneeling, standing rows

the bonds, stronger than gravity,

that held our lives in such close orbit.

The shuttered lens looked past the candid clowning

and froze the rushing freedom of halcyon blood

in a foolish pose of comics pandering to the camera.

No mountain forest vista fits in a 35 millimeter horizon.

The setting sun always leaks color far past the abrupt borders.

Even in the controlled studio environment,

so close to the chemical smells of the darkroom

where the image creeps secretly onto dripping paper,

the snapping shutter focuses selectively.

Her nudes,

far from paying homage to female form or statuesque grace

expose a new fault in each polished splash of black and white.

"I am not resplendent here, I look dead.

And there my ass is a mile wide."

But there are times  
as rare as ytterium or four minute mile,  
when it happens.

The deepest fear of the aborigines,  
the glossy paper traps a soul.

Sounds of Silence

Curled together side by side  
The silence hangs warm as covers over the bed.  
Poised on the edge of sleep  
your question echoes across the chasm of sweet oblivion  
Yanking me back to the bed and the room.  
"A penny for your thoughts" you asked  
And I can only shrug with the futility of trying to tell you  
Whirlwind sweeping mountains that they are.  
I could not even lead you close with words  
Spectral, empty sounds and letters  
hollow, so defined and misunderstood.  
I open my mouth and feel like a fool  
Trying to catch the sky in a glass,  
like a spider shadow,  
with a piece of cardboard.

## Hanging

Do you know I'm hanging

On your every word

Somewhere in your voice dear

The strangest hush I've heard.

I do a lot of thinking

When you're not around

Remembering every word you said

and braiding every sound.

How can I smile

when you say

everything's ok

How can I tell you

What a word is worth

Your voice is the rope I hang from

My feet don't touch the earth.

Your picture on my wall it seems

To have a tale to tell

Your eyes are like two blackbird

in a tree I've come to know so well

How can I smile

when you say

everything's ok

I do a lot of thinking

When you're not around

Remembering every word you said

and braiding every sound.

Do you know I'm hanging

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