

Cultural Flocculation:
fermenting food. fermenting culture.
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The goal of this event is to empower the Bacteria, through the qualities of fermentation, to bring us into a synaesthetic experience through analogical thought in such a way that we are individually transformed through a type of fermentation, so that as we each flocculate to our unique life-dreams, we are then a seed--a culture--that takes up residence in the dominant petri-dish; thus we experience aisthesis, harmonic and inspiring. Welcome.

Beginnings...We're going to spend just a few minutes going back, all the way to the beginning of the beginning, to the primordial soup...what do we find there? Bacteria!!!

"In the first 2 billion years of life on Earth, bacteria—the only inhabitants—continuously transformed the planet's surface and atmosphere and invented all of life's essential, miniaturized chemical systems."

-Lynn Margulis

and they still are...

"Coevolved symbiotic relationships between bacteria and multicellular organisms are a prominent feature of life on Earth. The importance of bacteria and our bacterial interactions *cannot be overstated*. We could not exist or function without our bacterial partners."

-Sandor Katz

I repeat: the importance of symbiosis with bacteria cannot be overstated!

Like all complex multicellular life-forms, the human body is host to an elaborate indigenous biota, with some geneticists suggesting that we are a composite of many species. In our bodies, bacteria outnumber the cells containing our unique DNA 10 to 1...that's 10 "not you's" to every one "you."

-Stephen Buhner

multi-speciel...lines really start to blur here

So at this point you may be wondering if you are in the right class; "I thought this was a vegetable fermentation class? What does all of this have to do with fermentation?" I can hear some minds questioning. It is my gut feeling (influenced by the micro-herds of healthy organisms living there) that the bacteria are working in conscious & close relationship with our Gaian provider to continue the thribal dance beyond time that has carried life thus far; and that the reason we each find ourselves sitting in this room right now is not simply because we are curious about fermenting food...

Perhaps each of us are here because we are being summonsed by the bacterial messengers & the Gaian Spirits themselves to be here as witnesses to the unfolding of a new renaissance, one in which we begin to recognize the beauty & sentience in all beings, from the tall to the small, beginning with bacteria, growing them, loving them,

eating them...excreting them.

in joyous symbiosis; and as we heal our guts, so our hearts and our spirits. May the Anti-Bacteria war end and awareness of the sacred value of these bacterial brethren manifest themselves fully in our species--literally & metaphorically. Let us be the voice for the voiceless; because if we don't listen, they *will* make themselves heard...

Just a few things to remember:

-Bacteria in our gut enable us to live. We could not survive without bacteria. They allow us to digest food, to assimilate the nutrients in our food and play a huge role, just beginning to be understood, in our immune functioning and in many other processes in our bodies. All life has evolved from bacteria and no other form of life has lived without bacteria. Our bacteria perform essential functions for us, and because we are continually attacking them effectively with all of the chemicals in our lives, simply replenishing and diversifying these populations has an under appreciated benefit for us...now you see the connection! We're living in a time right now of unprecedented cleanliness-which is often toxic. We swim in a chemical stew; our food is sterilized, pasteurized, homogenized, sometimes genetically modified, irradiated, refrigerated, & often shipped thousands of miles around the world before it reaches our tongues....what's a gut to do?

FERMENT IT ALL!!!

These are the things that I often ponder & why I love teaching this class. There is a huge connection between our relationship with eating & how we view the rest of the life on this planet. I feel that if we cultivate a deep & vibrant relationship with food preparation, preservation, presentation & the deep pleasure in nurturing ourselves & our beloveds, we can then collectively project that excitement onto our relationship with all beings, & enliven the healing of the planet. That is why this is a cultural revolution, a food roots movement to re-embrace life. Thank you for being part of it! May we all part ways with a deeply "**Biophilic**" world view, coined by biologist Edward O. Wilson, to refer to the consciousness of ourselves as coevolutionary beings, part of a greater web of life...each of us have an amazing part to play... and fermentation is a key piece in healing!

- I. **What & Why?** Fermentation is defined **as** the transformation of food by various bacteria, fungi & the enzymes they produce, often for the purposes of preservation, inebriation, assimilation & efficiency.
 - A. **Preservation:** This form of preservation is not forever, like canned foods that you can put into a pantry or storm cellar and forget about for 10 years and still eat. These foods are alive and dynamic, and fermentation is an extremely effective strategy for preserving food through a few seasons, which is really the point. But think of an aged Parmesan & a glass of milk...big difference there in how something will last through the winter!
 - a. Refrigeration & canning are relatively new inventions-only a few generations old; and yet people do not know how to live without them!
 - b. Acidification by fermentation is a brilliant safety mechanism for food storage, making it nearly impossible for pathogenic organisms to take up residence in most fermented foods.
* **THERE HAS NEVER BEEN A CASE OF FOOD ILLNESS DUE TO FERMENTED Veggies ON RECORD with the CDC...EVER!!!** So its much safer than many people believe.
 - B. **Inebriation:** It is believed by some that before we captured fire as a species, & held the wisdom to use this magnificent tool, we were aware of, at least, if not deliberately harnessing the magic of micro-herds to create the inebriating effects of fermentation. (primates, elephants, mice, treeshrews, etc.)
 - C. **Assimilation:** Fermented foods are good for you, predigesting enzymes, thus freeing up nutrients for the body to absorb, & often generating additional nutrients, as well as removing toxins.
 1. Healthy guts have been implicated with strong immune systems and even higher intelligence in many studies.
 2. Fermented foods are often higher in B vitamins, micro-nutrients & culture specific enzymes than the raw materials before fermentation.
 3. Detoxify: oxalic acid is broken down via fermentation, as is cyanide. Also, phytates (found in all legumes, seeds, nuts & grains, act as an anti-nutrient, binding minerals & nutrients) is broken down via fermentation, thus releasing & improving mineral absorption.
 4. Some pesticide residues are found to be broken down via fermentation.
 5. Pre & Probiotics are provided to nourish and heal the gut, as well as keep it all running smoothly! (metaphor of preparing garden soil for the seeds...pre is soil, pro is seed.)
 - D. **Energy efficiency:**soaking saves cooking fuel; fermentation acts as a pre-digestive step, meaning that our bodies need to utilize less energy to absorb nutrition; less refrigeration necessary...
- II. **How?** "How can I have all of these wonderful benefits in my gut?" you say. Well, to begin, we will learn the four basic methods of **vegetable fermentation**: a liquid infusion, the brine method, the Kim Chi method, and the Kraut Method. Let's look at each of these in depth.
 - A. Liquid Infusion: (SOUR TONIC BEVERAGES or STB's) By fermenting veggies in a high proportion of water, nutrients infuse into the liquid, resulting in delicious sour, live-culture tonic beverages.
 1. Beet Kvass: 1 sm beet, 1 clove garlic, piece of ginger & turmeric, 2-3 Tbs salt, ½ G H2O; *hot pepper (optional)
 2. Kaanji:delicious spicy Punjabi beverage:1/2 # chopped carrots (traditionally purple, or you can add a beet), 1-2 Tbs ground mustard seeds, 2-3 Tbs salt, ½ gallon H2O. Cover & ferment for about a week, strain & serve chilled!

3. Combine desired ingredients in 1/2 gallon jar w 2 Tbs salt, fill with tepid water, cover and wait!
- B. Brine Method: Very simple & exciting...fill jars with whole veggies (beets, radishes, garlic, small eggplant, okra, green beans, cukes (mouse mellons!), Brussels sprouts w/ pearl onions, squash, pumpkin(chopped into large pieces)...your imagination is the limit! Add herbs & spices, garlic, peppers, ginger, turmeric, horseradish, etc.; add oak, grape or horseradish leaves for tannins (to preserve crunch); add 3 Tbs salt Per Quart of veg for roughly 5% salinity; cover w water. *Note: burp these if you are doing many & they are sitting for awhile, as pressure can build.
- C. Korean or Kim Chi Method: Doing this method in its truest form is an art that has developed for centuries in Korea and throughout Asia. "Sweat" veggies first; this was traditionally done w sea water, evaporated to up to 15% salinity. Veggies are placed in strong brine for 10-24 hours then rinsed; or heavily salted and left to sit for 3-6 hours or more. In the past, these steps sometimes took 5-9 days! Ginger, garlic, chili, green onions & more are combined with a little wheat or rice flour and made into a paste. This is rubbed onto the leaves of the sweated napa cabbage, or mixed with the chopped veggies. It is this carbohydrate component that gives kimchi its characteristic effervescence. Also, it is often fermented for a much shorter time, only days in some cases. This works wonderfully in a fresh veg climate, and you can use more dark leafy greens. When Korea sent its first astronaut to space, he went w a specially developed kim chi because scientists feared mutations happening via radiation in space; so they had to develop a kim chi that was bacteria free, but still maintained an authentic flavor, without driving the non-Korean astro's crazy with the pungent smells!
- D. Dry Salting or Kraut Method: This is the method I employ most often and is comprised of 5 basic steps: chop, salt, bruise, pack, wait.
1. **Chop** desired veggies into pieces that please you; there is no right or wrong way. Do consider the rate at which things will ferment, for ex., carrots are very hard & dense & ferment more slowly than shredded cabbage; beets are in between, etc. Things with very strong flavors such as garlic, ginger, turmeric, etc. should be diced finely to disperse their flavors evenly and avoid big bang bites. Have all of your little piles or bowls of ingredients ready, along with your spices and salts. In a large bowl (or two if you want to have fun experimenting with different styles), layer your ingredients in proportion and sprinkle on chosen salts & spices as you go. A base measurement of salt is between 2-3 Tbs per 5 pounds of veggie material; however salting is complex (see below).
 2. **Salt**...oh, salt! I love salt; it is a magical substance found in so many different forms all around the world. Different salts have a different "saltiness" according to their size and origin, so get to know your salts. Avoid iodized salts if possible. Salt & temperature have a very important role, which we discuss in class, but in general, remember: longer time and/or higher temp=more salt; less time/colder temperature=less salt. A good rule of thumb when salting ferments is to salt your finished veg mix a little saltier than you would like to eat.
 3. **Bruise** the veggies to release liquid as you crush the cell membranes. This is done by using a pounder or wine bottle for large batches; or I just use my hands squeeze and massage the veggies for smaller batches.
 4. **Pack** the veggies once they are nice and soft from bruising into chosen vessels a few inches at a time, being sure to push out any air pockets! Keep adding kraut & pressing as you go until jar is full and veggies are submerged in brine. Weight with folded cabbage leaf or clean stone &cover.
 5. **Wait**...this is the hardest step! And the most fun & rewarding. Have fun getting to know your ferments, but avoid eating off the top too much. Pack a jelly jar full to taste as you go to gauge readiness, and leave the other jars to rest. Burp if you seal the lids.
 6. This method is also excellent for condiments! I use a blender or food processor to get things to

the texture that I like, then salt, weight, and wait!

III. Other Fermented Non-Alcoholic Beverages

A. Kombucha and Jun

1. Produced via a SCOBY (Symbiotic Community of **B**acteria and **Y**east) or “Mother”
 1. 1 cup honey (jun) or sugar (kombucha) w ½ c loose leaf tea (green for jun, black for kombucha)

B. Water Kefir: strange little culture that converts the sugar into CO₂ and healthful yum!

1. Little Ginger Plant or Tibicos
 1. Both like the same treatment: ½ cup of sweetener per qt. of water...flavor options are endless! Also appreciates 1/8 tsp baking soda per ½ gallon and a splash of molasses
 2. This is a very fun SCOBY to experiment w flavors, fruits, coffee, etc.

C. Smreka: Wonderfully simple, yet complex: 2 cups juniper berries in 1 gallon of water...yum!

D. Herbal Sodas: by following the simple steps of Mead making, but using less yeast and honey, one can make delicious & nutritious sparkling sodas!

IV. Dairy

A. There are so many ways to ferment dairy; think of your favorite cheeses, yogurts, butter, and the simplest...kefir.

1. Kefir is an amazing culture from the Caucasus Mountains that is very different from the water kefir grains mentioned above; this one feeds on lactose, and is often called “The Champagne of Milk.” Microbiologists have been fascinated and perplexed by this SCOBY, as for years they have tried to bring together all of the components that make Kefir, but they can't get one to spontaneously grow in a lab; however, somewhere, at sometime, one did...
2. Does not contain a programmed death, meaning—in theory—it can live forever!
3. Kefir grains involve over 30 different microbes, some common, and others not even named in biology yet! Therefore the single most diverse culture you can commune with.
 1. Quite simple: Put grains in milk, stir. Wait. Strain; enjoy!

V. Grains & Beans

A. Oh so many wonderful ways to ferment grains; in fact, almost every culture seems to have its own version of a fermented grain that it loves and often identifies with.

1. Corn: so many cultures that I love depend on corn as their staple and have developed a wide array of fermenting corn to make it more stable, palatable and nutritious.
 1. Nixtamalization: using hard wood ash or hydrated lime to process the corn into a more niacin rich and delicious food
 2. Pozol, atollí and chicha are other beloved corn ferments
2. Wheat: Sourdough...a wonderfully diverse food, wheat is much improved upon through fermentation..
 1. breads, crepes, cakes, scones...so much can be made w sourdough
3. Beans: Beans are usually fermented in 2 distinct ways, cooked, and raw:
 1. RAW BEANS: most often are ground with another grain (often rice,) and fermented then made into cakes or crepe-like flat breads. Idli and dosai are the most well known from Indian culture, but there are many others, each combination of different beans and grains having a different name in various cultures.
 2. COOKED BEANS: Typically cooked beans are cultured with a specific starter, for instance, soy beans are cultured with koji to make tempeh, miso and even Sake'.

VI. Meat: Fermenting Meat is an art unto itself; books--and lifetimes--have been devoted to it, so we will not spend too much time here, as it really is its own separate class. Suffice it to say that aging, drying, fermenting and curing meats are a complex and satisfying art form.

VII. Alcohol: And now we come to the Gateway Ferment, the thing that often is the beginning of it all. Once again, this topic is endless and a class unto itself (catch mine later, if you can!).

A. Basic Mead Recipe: 1 QT of honey per Gallon of water...the rest is a mystery left for another class

VIII. Troubleshooting: There are various mysteries that can find their way into your ferments. The following are the most common and how to deal with them.

1. Discoloration: can be from oxidation, Kahm yeast, or molds. No problem, just scrape & discard.
2. Yeast & Mold Blooms: these are usually harmless yeast blooms and can just be scraped and discarded. They remain on the surface so the remaining food is still good. However, sometimes a mold grows on top of the yeast; these are not desirable to eat and should be removed and discarded sooner than later. White, beige, green, grey are all fine. Be careful of very black or pink to red molds.
3. Bugs: Fruit flies and gnats love to lay their eggs in ferments and around the rims of the jars. If you see little white wigglers, scrape off the top inch or so & discard; the rest is fine as these critters cannot live or penetrate below the liquid level.
4. Sliminess is common, especially with carrots. I recommend keeping your ratio of carrots to other veg low, or knowing that you are going to have to wait for that stage to pass, as the next stage produces an enzyme that cleans up the sliminess.
5. Smell. Sometimes ferments can smell bad, and still taste delicious! Many ferments go through a farty stage; but be patient. The end result is usually worth it!

IX. To conclude, remember: The rule of thumb is as many different kinds of fermented foods as often as possible...variety truly is the spice of life, and the health of the gut! We must increase bio-diversity in the gut in the face of bio-diversity genocide in our culture; but remember: these foods are medicines; more in *variety* does not mean more in *quantity*... a little goes a long way. And as you connect more deeply with the time honored traditions of food, and the flora and fauna who inhabit our own selves, may you find joy. Now, go home & ferment something!

"Unquiet souls. In the dark fermentation of Earth, in the never idle workshop of nature, in the eternal movement, yea shall find yourselves again."

-Matthew Arnold

"Civilization rests on two things," said Hitzig; "the discovery that fermentation produces alcohol, and voluntary ability to inhibit defecation. And I put it to you, where would this splendidly civilized occasion be without both?"

-Robertson Davies