

A vibrant, stylized illustration of a tropical jungle scene. In the center, a large, textured pineapple sits atop a slice of watermelon. To the left, a toucan with a large orange and yellow beak and blue body is perched. The background is filled with various tropical leaves in shades of pink, teal, blue, and yellow, along with a small pink flower. The entire scene is set against a solid yellow background.

FERMENTATION & FLAVOUR STABILITY

Looking at 3 major fermentations and making ingredients that have a longer shelf life, so we can get the most out of what we have



01

ABOUT ME

Trash Collective
Supernova
Black Lagoon

03

DONT KILL ANYONE

Common Mistakes
Safety First
Contaminants to look for

05

RESOURCES

Books
People to Follow
Reference guides

02

WILD VS. CONTROLLED

Understanding two major
types of fermentation

04

3 Major Ferments

Wine/Beer/Tepache*
Lacto
Kombucha

06

DRINKS

The best part! Using your
ferments in a cocktail



THE HISTORY OF FERMENTATION

Fermentation is a cocktail 'trend'

Archeological history dates back thousands of years - evidence from 10k years ago

ALL LIFE IS COVERED IN MICROORGANISMS

Adult Human bodies host 1 Trillion micro organisms, outnumbering our cells 10:1

This applies to every single food, vegetable, fruit - foraged, farmed or otherwise



WILD VS. CONTROLLED



CONTROLLED

INDUCED FERMENTATION

Starting the fermentation process with a cultivated yeast starter, thus giving the process a head start

EXAMPLES:

- ★ Wine, Bread or Beer Yeasts purchased from a grocery store or u-brew/u-vin
- ★ In distillation, this means any fermentation using cultivated yeast strains



WILD

NATURAL FERMENTATION

Create conditions to inhibit undesirable fermentation but allow desirable fermentations to occur. Yeasts are in the air.

EXAMPLES:

- ★ Often in natty wine
- ★ Creating a kombucha starter from tea

BOTH ARE A FORM OF FOOD PRESERVATION SINCE THEY PREVENT OR SLOW THE GROWTH OF SPOILAGE MICROORGANISMS BY CULTIVATING THE 'GOOD' ORGANISMS



WHICH ONE TO USE?



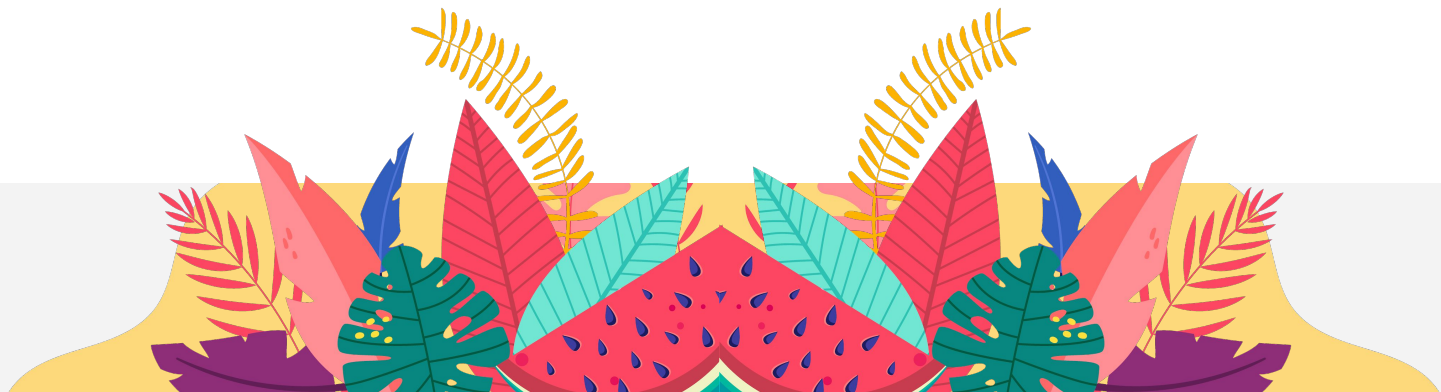
CONTROLLED

- ★ Often gets fermentation going quicker, yielding the end product faster
- ★ Control... different yeasts can yield different qualities in the final liquid, which can be fun to experiment with

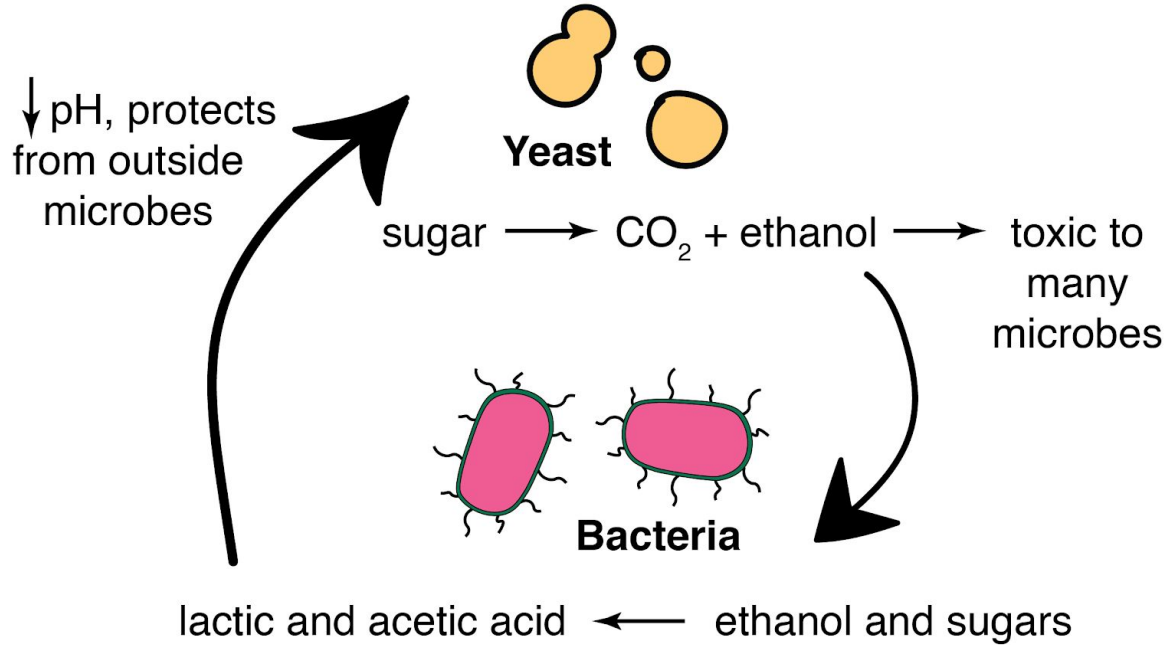


WILD

- ★ Different yeasts from atmosphere come together in the fermentation creating:
 - More interesting flavors in final liquid
 - More unpredictable results
- ★ May take more time, depending on climate



EXAMPLE: KOMBUCHA MICROBIAL WARFARE



SCOBY: Symbiotic Community Of Bacteria & Yeast

DEEPER ON WILD VS CONTROLLED

SCIENCE & COOKING LECTURE SERIES

"Flavor and Fermentation"

Arielle Johnson, Ph.D., @arielle_johnson
Flavor Scientist, Gastronomy and Innovation Researcher,
Co-founder of the Noma Fermentation Lab

SCIENCE & COOKING

Sponsored by

**7 PM - Monday
September 19**

Science Center Hall C
1 Oxford St, Cambridge MA
<https://sciencecooking.seas.harvard.edu/>

Logistics Hub

mrsec
Molecular Research & Science Center

SHIMADZU
Excellence in Science

Brad & Taylor

**fermentation
revolution**

70 easy,
healthy recipes
for sauerkraut,
kombucha, kimchi
and more

SÉBASTIEN BUREAU AND DAVID CÔTÉ

**herban
cura**

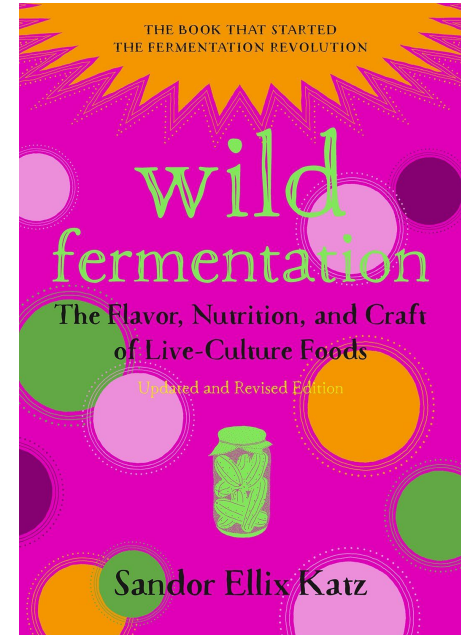
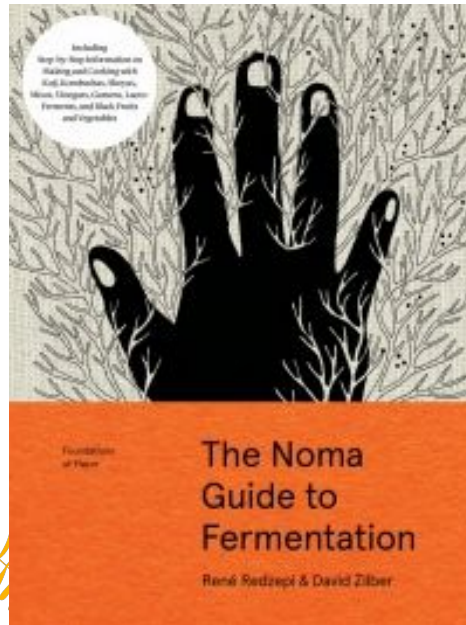
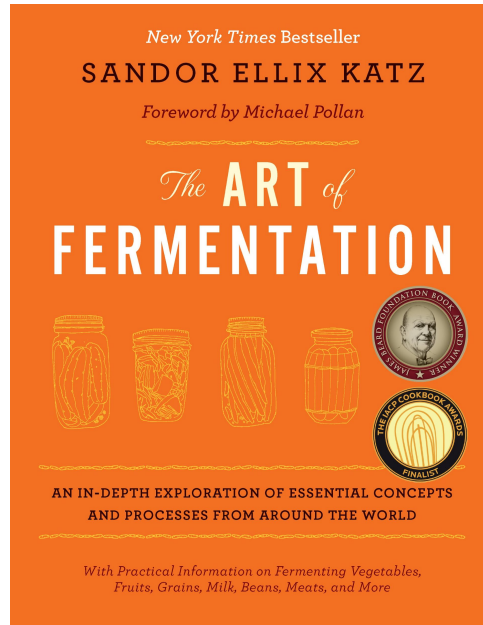
**DEMYSTIFYING
FERMENTATION**

WITH
SANDOR ELLIX KATZ

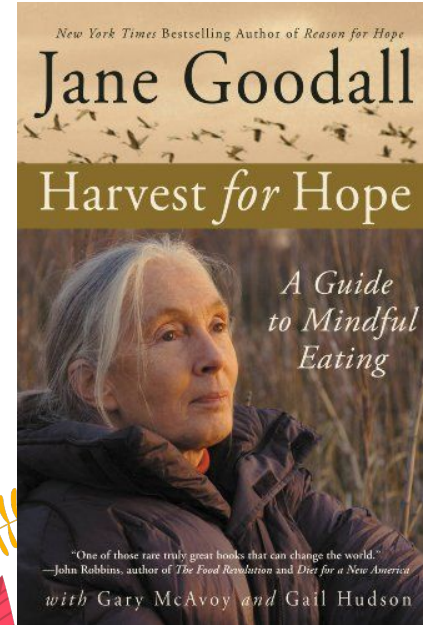
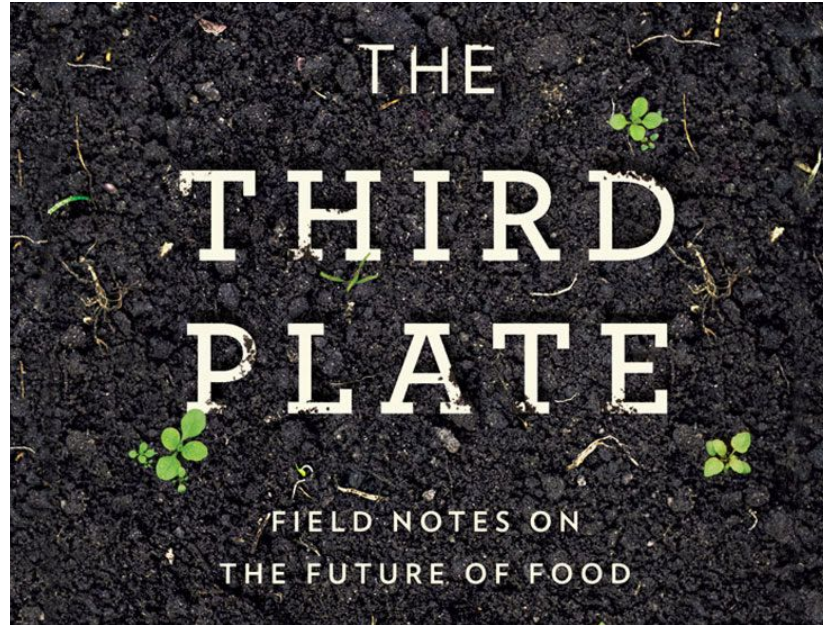
**APRIL 2ND
3:00PM - 5:00PM EST**



DEEPER ON WILD VS CONTROLLED



FOOD SYSTEMS & SHELF STABILITY



AEROBIC VS ANAEROBIC



AEROBIC FERMENTATION

Needs oxygen rich conditions to grow and thrive

EXAMPLE:

- ★ Wine or Beer Yeasts
- ★ Kombucha



ANAEROBIC FERMENTATION

Needs oxygen deprived conditions to grow and thrive

EXAMPLE:

- ★ Lacto-fermentation
- ★ Sauerkraut
- ★ Kimchi







101 BEST PRACTICES

GLOVES

You may have washed your hands 50+ times today. They still have weird oils and bacteria under your nails, best to just use gloves.

VESSELS

As fermentations occur, they produce acids which will degrade certain metals over time. 'Booch is best in glass, or use a wine & beer can be done in a plastic fermentation tub specifically made for well, fermenting.

CLEANING STUFF

POTASSIUM METABISULPHITE
is your friend

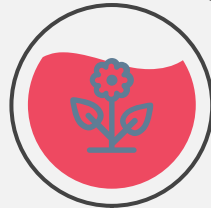
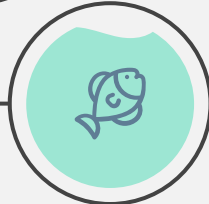
SPACE

Keep it warm, dry and in a low traffic area. Feet kick up dust, dust has contaminants, contaminants suck.

CONTAMINANTS SUCK!

Botulism

Common in low-acid
CANNED food. - grows
in Anaerobic conditions
(without oxygen).



Salmonella

Not as common, caused
by contaminated foods
that are not cooked
(which we are working
with here). Just wash
your veg/fruit well!

Eels

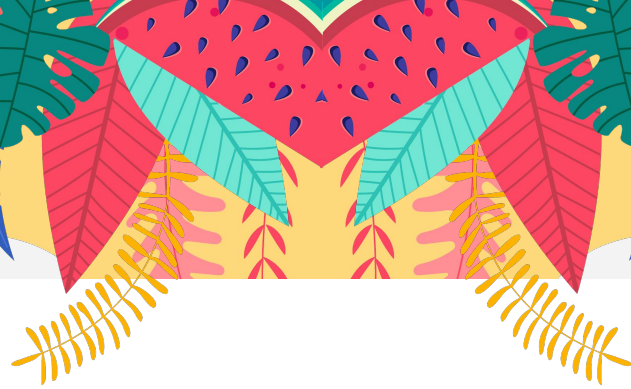
These are SO GROSS and
happen most commonly
on Kombuchas

Outside Contaminants
When ANYTHING is left
uncovered you leave your
ferment open to exposure to god
knows what. Cover it properly



EELS...





BASIC FERMENTS

WINE/BEER

YEAST + SUGAR +
FRUIT/GRAIN + WATER

LACTO FERMENT

VEG + SALT

KOMBUCHA

SCOBY + TEA +
SUGAR



WINES & BEERS TEPACHE & NATURAL YEAST

BASE RECIPE

YEAST: Champagne
EC-1118

SUGAR: 5kg

WATER: 15L

PEACHES: 4kg

Yield : 20-25 L



LOOK OUT!

Taste regularly - can over
ferment into a vinegar

White scum on tepache
(after bubbles have
subsided)

Keep covered with airlock



LACTO FERMENTATION

BASE RECIPE

**FRUIT OR
VEGETABLE:** 1 KG

SEA SALT: 20 g

WATER: Optional



Optional to use a brine depending on your base. Mix base with salt, and leave to leach out any water. Add more if need be, keep your salt ratio to 2% minimum

LOOK OUT!

Look for the water to go from clear to cloudy - thats it done!

Fruit or Veg will lose vibrancy thats normal. Anything PINK or BLACK or any other weird colour - TOSS IT

Needs to be fully finished fermenting! Otherwise contact with oxygen could introduce harmful bacteria



KOMBUCHA

BASE RECIPE

SCOBY: ONE-KENOBI

SUGAR: 20%

TEA: HIGH
TANNIN

NOTE: Dosage for a
secondary
fermentation



LOOK OUT!

EELS!

Two ways of creating
FIZZ

Scobies can look weird and
the tea will discolour them.

Make sure they have
bubbles and smell like
Kombucha.

Fermentations will slow
over time as your scoby
ages. Simply use the baby
and discard the old boi

CONTROL FACTORS

TIME

Taste your ferment daily
(sometimes more in hot/humid
conditions).



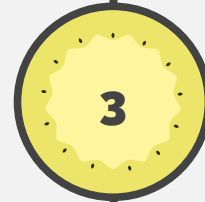
TEMP

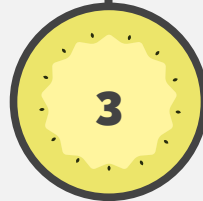
The temperature and RH
(relative humidity) in the
room will affect how
quickly it ferments

SUGAR

Type, and amount obviously make a
difference

Add a second bump of sugar for
secondary fermentation





AIR

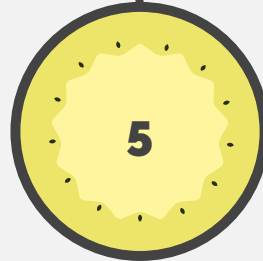
Aerobic or Anaerobic?
Air quality is important

Basements vs Farm Air



PH

Do you want to ferment
to acetic property?

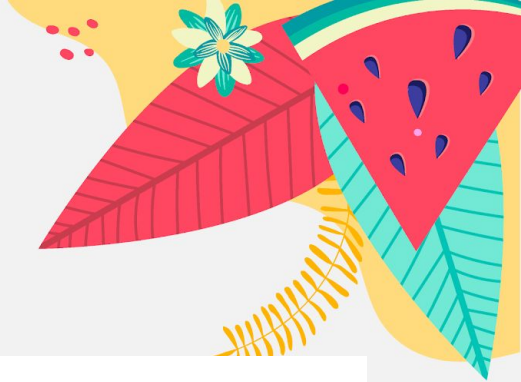


BASE

The fun bit...



ARRESTING FERMENTATION

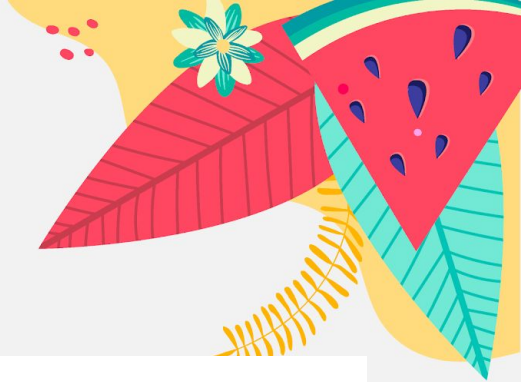


ONCE YOU'VE FERMENTED TO THE DESIRED STATE YOU MAY OR MAY NOT HAVE A BIT OF
RESIDUAL SUGAR - EITHER ARE OK!

Some things to remember:

- ★ Yeast are very good at reproducing and thriving only alcohol or extreme heat will kill them completely
- ★ Fully fermented liquids means the yeast has eaten all sugar and turned it to CO_2 + Alcohol
- ★ Residual sugars means that the fermentation has been stopped (arrested) leaving a little bit of sweetness behind
- ★ Most of these types of ferments contain alcohol - do not use them in Non-Alc drinks

ARRESTING FERMENTATION



SOME WAYS TO ARREST FERMENTATION

- ★ Fortifying - Alcohol kills yeast
- ★ Cold Shock
 - Strain out solids
 - Filter through superbag or coffee filter to remove most yeast (you can still use for another batch!)
 - Store in a vessel between 4C and -2C - do not let it freeze or you will lose your flavor!
 - Let sit for a few days, monitoring to ensure the fermentation doesn't kick up again and filter to remove any remaining yeast

A decorative border of various tropical leaves in bright colors like yellow, orange, red, teal, and purple surrounds the central text area.

BUILDING DRINKS WITH FERMENTATION

USING VINEGAR AS A CITRUS

WINES - LOW ABV ALTERNATIVE

ADJUSTING SUGAR/ACID LEVELS