ON TAP

KOMBUCHA

Raspberry

Ginger

Straight (in bucket)

KOMBUCHA BEER

Barleywine

Strawberry-Rhubarb Saison

AGENDA

1. Kombucha Lexicon
2. Brief History
3. SCOBY
4. Yeasts, Bacteria, and other cool stuff
5. Fermentation Cycle
6. pH
7. Supposed Health Benefits
8. Basic Equipment and Recipe Ratios

Kombucha

Kombucha is a fermented , lightly effervescent, low alcohol tea. It is often referred to as a living food, due to its probiotic nature. Kombucha is fermented by using a **S**ymbiotic **C**ulture **o**f **B**acteria and **Y**east.

LEXICON

Kombucha - Dr. Kombu, Cha (Japanese for tea)

SCOBY – Symbiotic Culture of Bacteria and Yeast

Nute – Nutrient-dense substrate that microbes transform during fermentation. For kombucha, the nute is sweetened tea. Nute is to kombucha as wort is to beer.

Kombrewer - One who brews kombucha.

Kombuchasseur – One with a palate attuned to the complexity of kombucha and is easily able to discern the quality and strength of a particular kombucha brew

LEXICON

Reverse Toxmosis **– Simultaneous act of detoxing and toxifying, as in drinking kombucha beer**

Fermentation **- Any of a group of chemical reactions that split complex organic compounds into relatively simple substances, especially the anaerobic conversion of sugar to carbon dioxide and alcohol by yeast.**

Aerobic **– Requiring the presence of oxygen for life**

Anaerobic **– Living in the absence of oxygen**

INTRODUCTION

- A journey with a Mother and her babies
- Brief History
- Disappearance
- Re-emergence
- Hyper-Health Awareness

- ***SYMBIOTIC*** – having an interdependent relationship
- ***CULTURE*** - *Biology,* the product or growth resulting from the cultivation of microorganisms
- ***BACTERIA*** – Ubiquitous microscopic single-celled organisms without an organized nucleus or organelles. There are ten times as many bacterial cells in your gut as there are human cells in your body! Well known food spoilers. Most ferments are the result of this same bacterial activity done in a way that enhances flavor, nutrition and digestibility of a substrate.
- ***YEAST*** – Microscopic (mostly) single-celled organisms that have organized nuclei and organelles. They are everywhere, especially on sweet fruits and carbohydrate-rich grains. They are capable of fermenting carbohydrates into alcohol and carbon dioxide.


"Baby" SCOBY
"Mother" SCOBY


SYMBIOTIC
FERMENTATION

THE BASICS

- Yeast eat sugar, producing carbon dioxide and Ethanol.
- Bacteria eat ethanol, producing Acetic Acid.
- Acetic Acid lowers the pH of the substrate to a level that makes it virtually impossible for non-kombucha microbes to contaminate your brew…
- AND… yeast can survive this environment

The Deep Stuff

- Yeasts metabolize sucrose to glucose and fructose.
- *Komagataeibactor xylinus* is responsible for synthesizing glucose into the cellulose that forms the SCOBY.
- This facilitates the environment for the bacteria and yeast to grow in a symbiotic relationship.
- The glucose also produces ethanol and carbon dioxide
- Ethanol feeds *Gluconacetobacter* (the major acetic acid bacteria genus found in kombucha). It contributes to the decrease in pH during the fermentation process by converting glucose to gluconic acid and ethanol into acetic acid and provides a safe harbor for yeast.

FERMENTATION AGENTS

Yeast

- Saccharomyces
- Brettanomyces
- Zygosaccharomyces
- Candida
- Pichia
- Schizosaccharomyces

- **Zygosaccharomyces Kombuchaensis**

  new ascosporogenous yeast from Kombucha tea produces alcohol and carbonation

Bacteria

- Acetobacter
- Bacillus
- Gluconacetobacter
- Rothia

- **Gluconacetobacter Kombuchae**

  feeds on nitrogen (tea) produces acetic acid & gluconic acid and the cellulose


FERMENTATION
BY-PRODUCTS

COMMON ORGANIC ELEMENTS

ACIDS

- Amino
- Butyric
- Glucaric
- Gluconic
- Lactic
- Oxalic
- Propanoic
- Succinic
- Caprylic
- Citric
- Capric

VITAMINS & ENZYMES

- Vitamin C
- Vitamin B1 – Thiamine
- B2 - Riboflavin
- B3 – Niacin, Niacinamide
- B5 – Pantothenic acid
- B6 - Pyridoxine
- B 12 – Cobalamin, Cyanocobalamin
- Niacinamide
- Enzymes
- Polyphenols
- Catechins


WHY ARE THESE BY-
PRODUCTS AR
IMPORTANT?

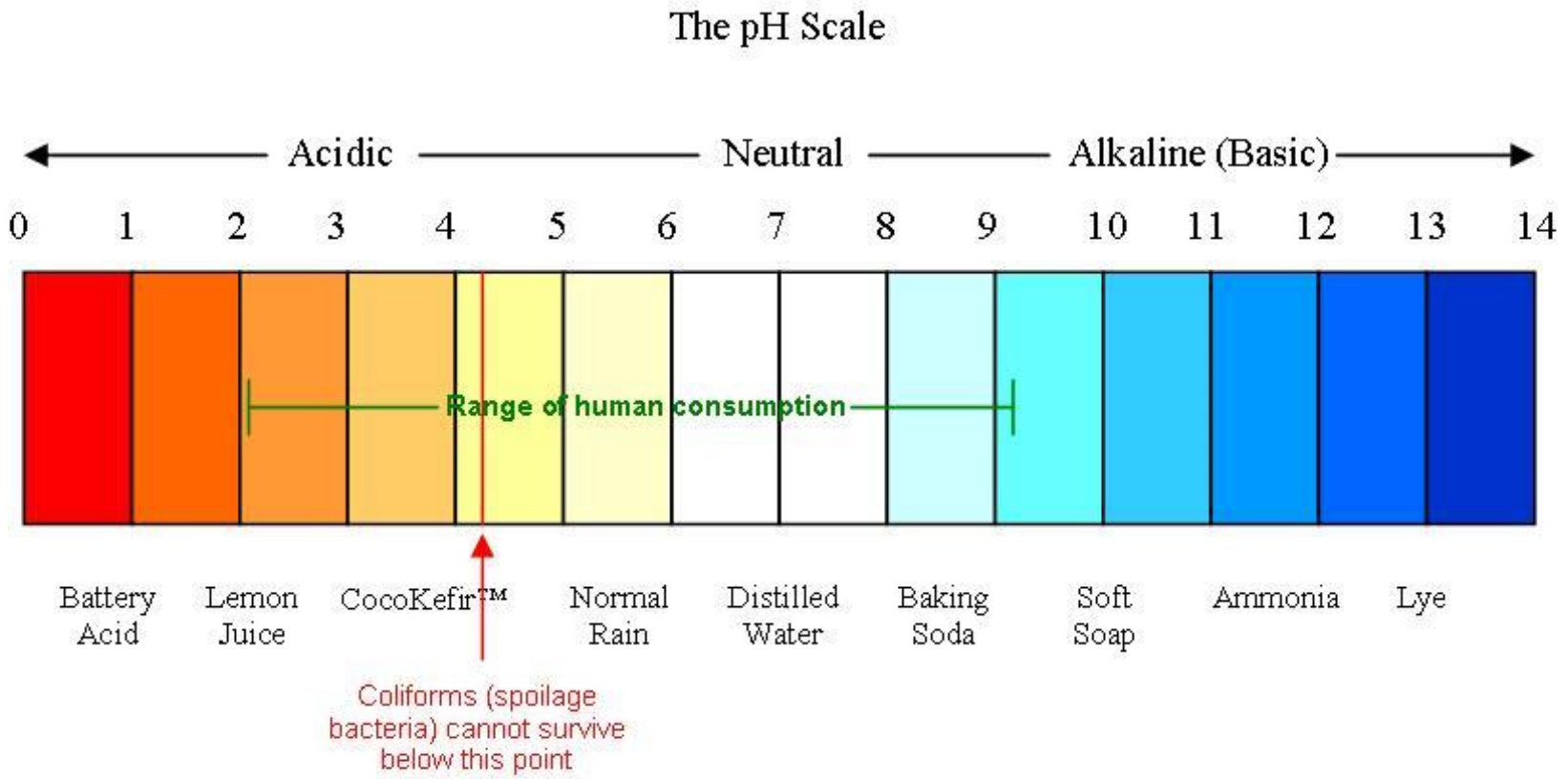
GUT BACTERIA AND HEALTH

- Fermented foods provide us with the regular influx of healthy, living bacteria our bodies need in order to boost proper functioning.

- Acetobacter/Gluconacetobacter, the dominant type of bacteria in Kombucha, creates acetic acid – one of the most healthy acids and a clue to Kombucha's low pH.

- Low pH = Creates a highly acidic environment in which our native bacteria and yeast thrive while simultaneously inhibiting the growth of disruptive foreign & potentially harmful microorganisms.

WHAT IS THE pH OF KOMBUCHA?



pH*pH*pH*pH*pH*pH*pH*pH*pH*pH

- Wort 5.2
- BEER 4.0
- Older Beer 3.5
- **KOMBUCHA 2.5-3.5**
- Lemon juice 2.0

SUPPOSED HEALTH BENEFITS

- Acid Reflux
- Acne
- Anxiety
- Arthritis
- Atherosclerosis
- Colitis
- Diabetes
- Eczema
- Excess Weight
- Fatigue
- Fibromyalgia
- Hangover
- Headaches
- Hypertension
- Hypoglycemia
- Indigestion
- PMS
- Radiation Poisoning
- Rheumatism
- Sluggish Metabolism
- Thinning Hair
- Tonsillitis

COMMERCIAL LABEL

How to make KOMBUCHA

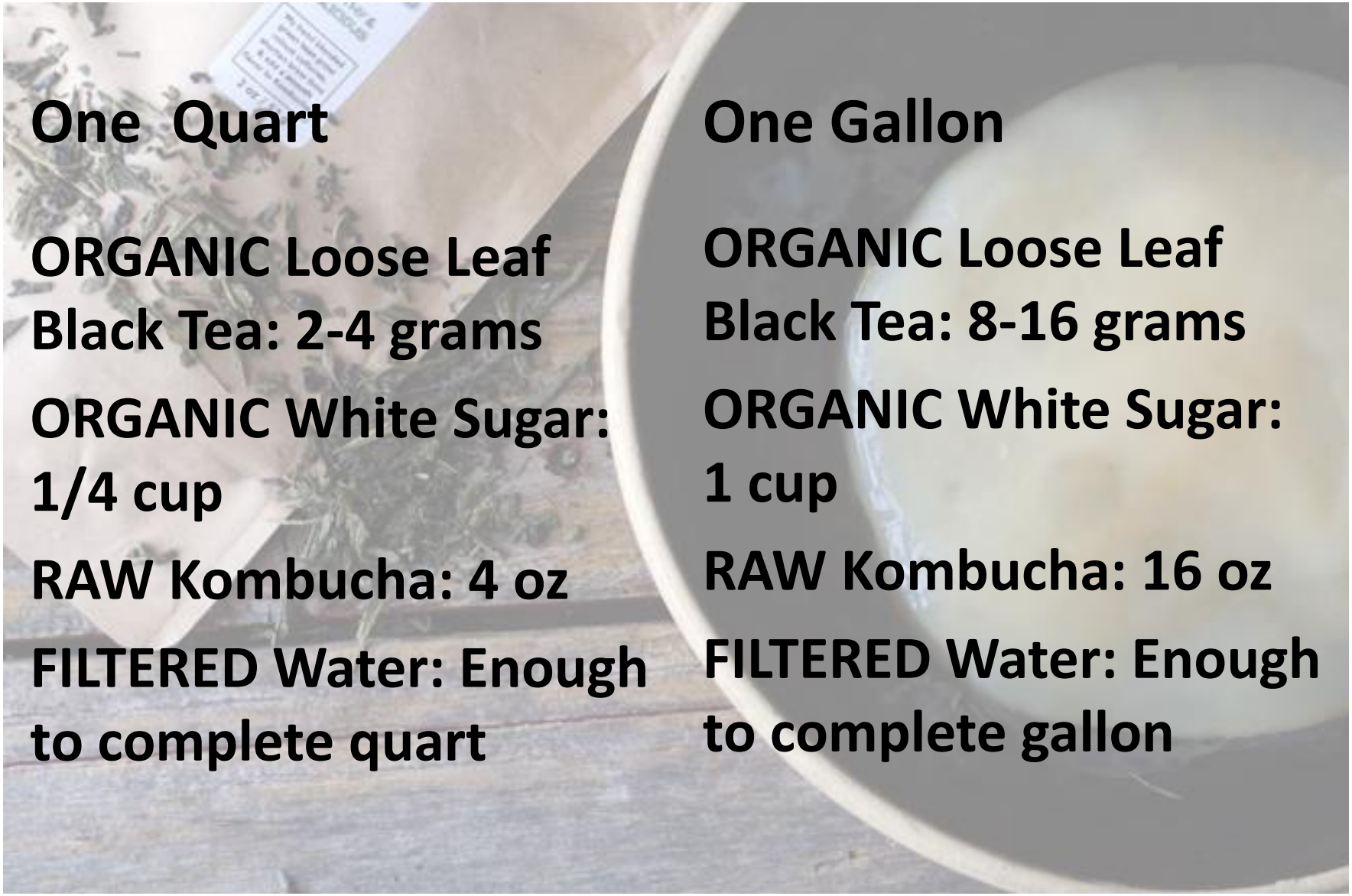
BASIC EQUIPMENT

- Glass jar
- Clean cotton cloth
- Stainless steel spoon
- Stainless steel pot
- Tea Strainer
- Thermometer
- Timer
- Heating Pad
- A room out of sunlight

INGREDIENTS

- **FILTERED Water**
- **ORGANIC Unflavored Tea (Black is Traditional)**
- **ORGANIC White Sugar**
- **RAW Kombucha**

BASIC RECIPE



One Quart

ORGANIC Loose Leaf Black Tea: 2-4 grams

ORGANIC White Sugar: 1/4 cup

RAW Kombucha: 4 oz

FILTERED Water: Enough to complete quart

One Gallon

ORGANIC Loose Leaf Black Tea: 8-16 grams

ORGANIC White Sugar: 1 cup

RAW Kombucha: 16 oz

FILTERED Water: Enough to complete gallon

INSTRUCTIONS

- Reserve some cool water to chill down
- Make a concentrated tea
- Steep times can vary and are typically longer than traditional tea steeping. 15-20 minutes

INSTRUCTIONS

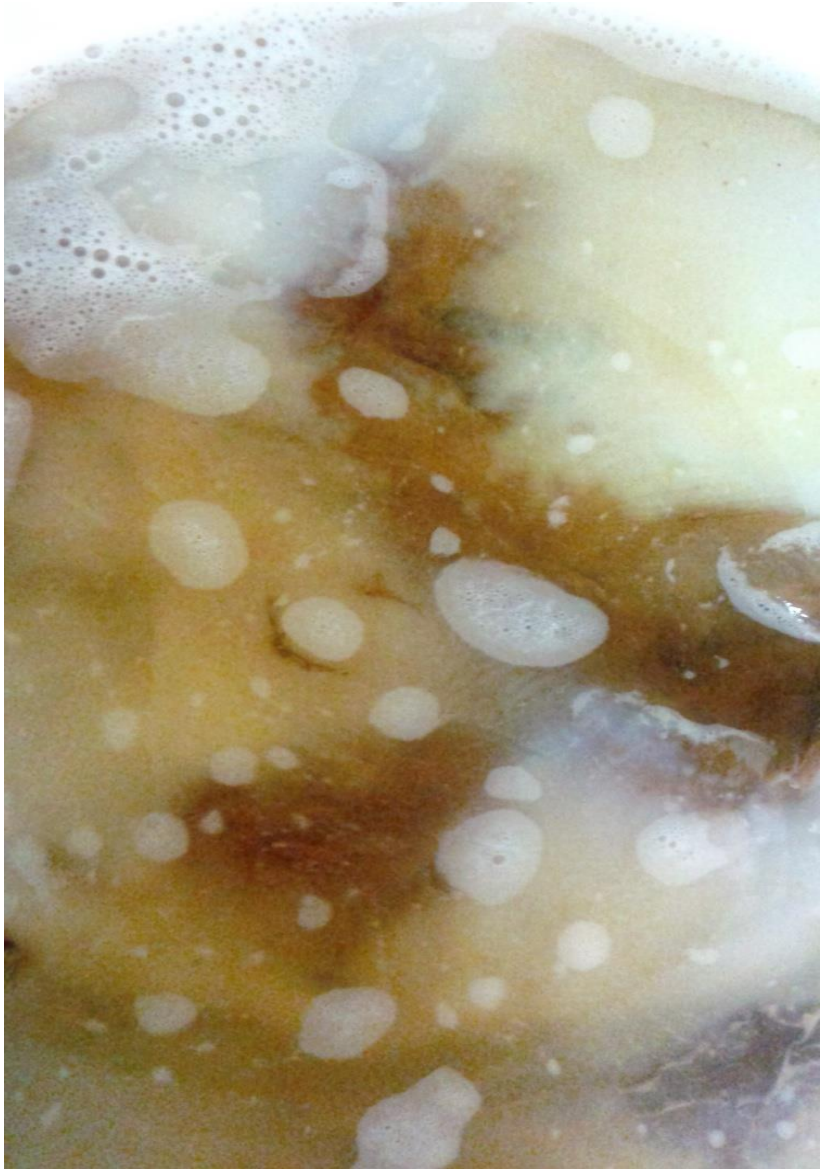
- Steep temperatures vary with tea types. 170-180 degrees is a typical range. Green is cooler, Black is warmer.
- To avoid tannin extraction, take care to never boil tea
- Separate liquid from solids
- Chill with cool water

INSTRUCTIONS

- Add kombucha
- Optimal fermentation temperature for kombucha is 75-85 degrees
- Add SCOBY when the temperature is BELOW 85 degrees
- If nute is too cool, place on heating element
- Affix any clean, tightly woven, cotton cloth to jar with rubber band
- Let if ferment out of direct sunlight

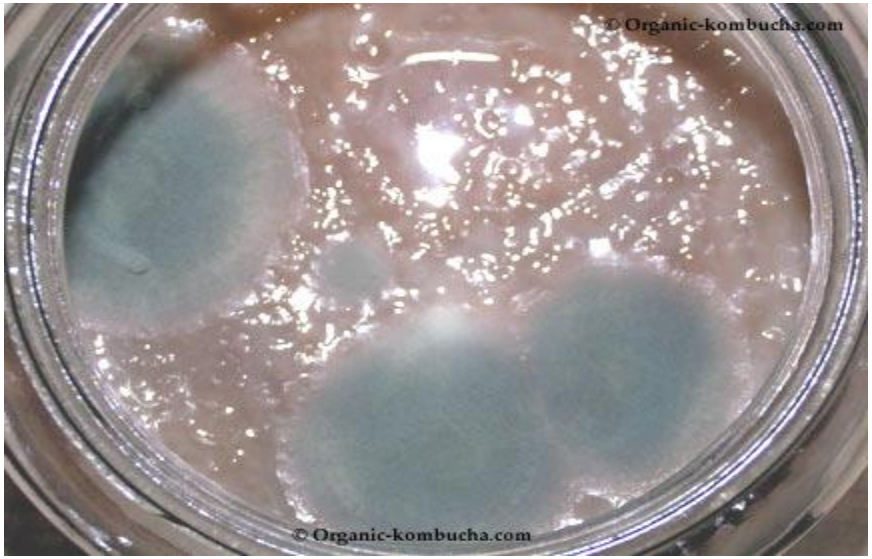
Instructions

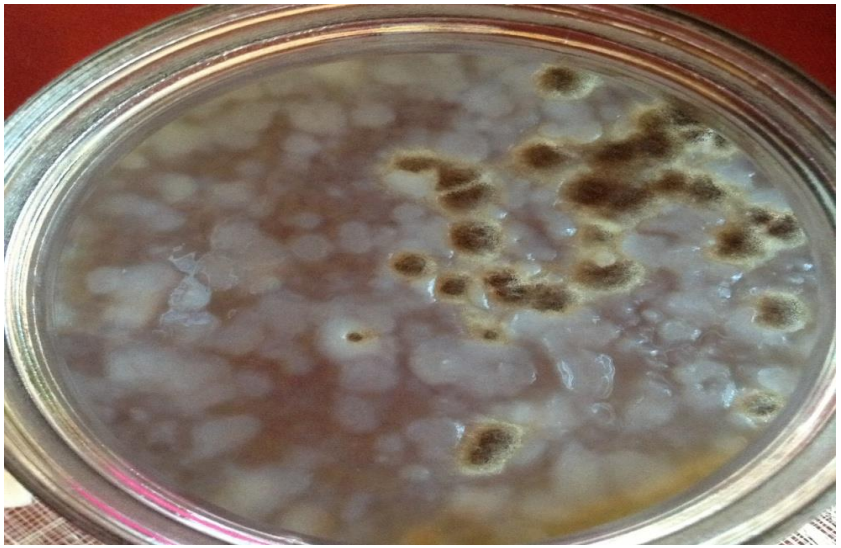
- **YOU will be the best indicator of completion.**
- Check as often as you feel necessary, especially during your first few brews. No need to worry about oxidation.
- After 7-10 days, you'll notice tiny bubbles at the surface and around the edges of your SCOBY; it will increasingly start to smell of vinegar.

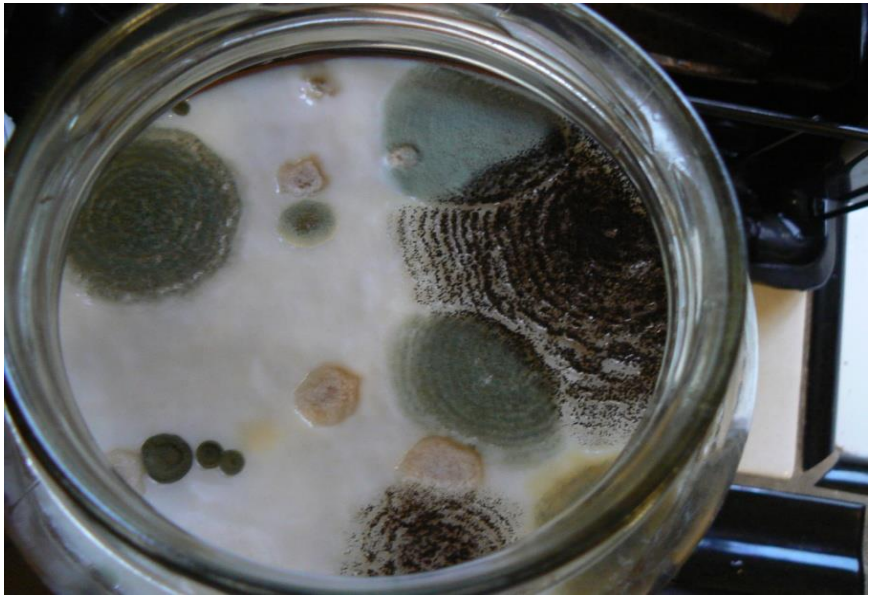


KOMBUCHA SHOULD NEVER LOOK, SMELL OR FEEL ROTTEN OR UNPLEASANT

CONTAMINATED SCOBYs





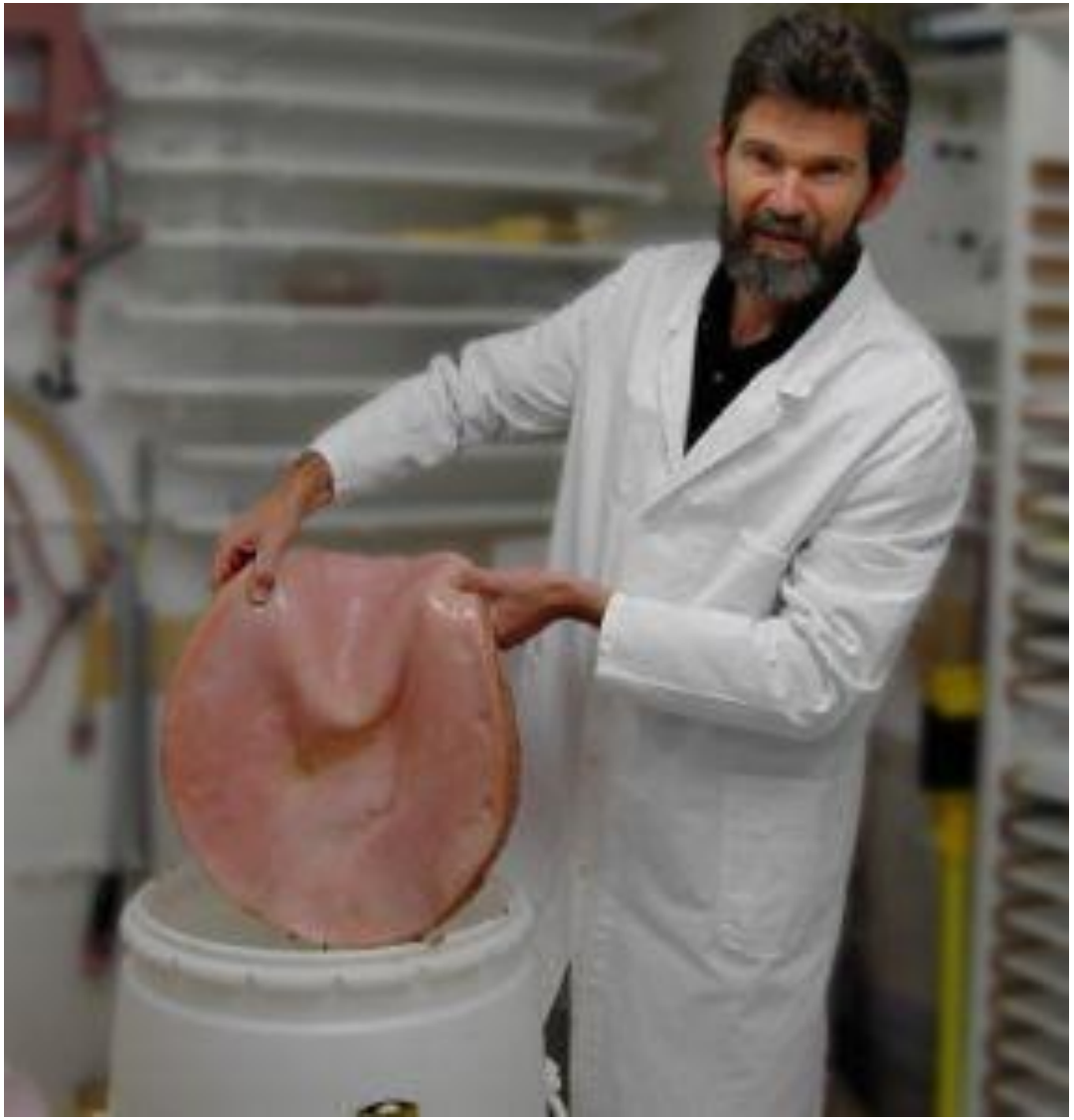


INSTRUCTIONS

- With clean hands, remove your SCOBY and let rest in a white vinegar bath rinse
- Save ½ of your fermented kombucha, discard the remaining
- Proceed to brew new batch of nute as per original instructions

INSTRUCTIONS

- Ratios of ingredients need not change with increased volume
- SCOBY girth, thickness and overall vitality will increase over time with new fermentations

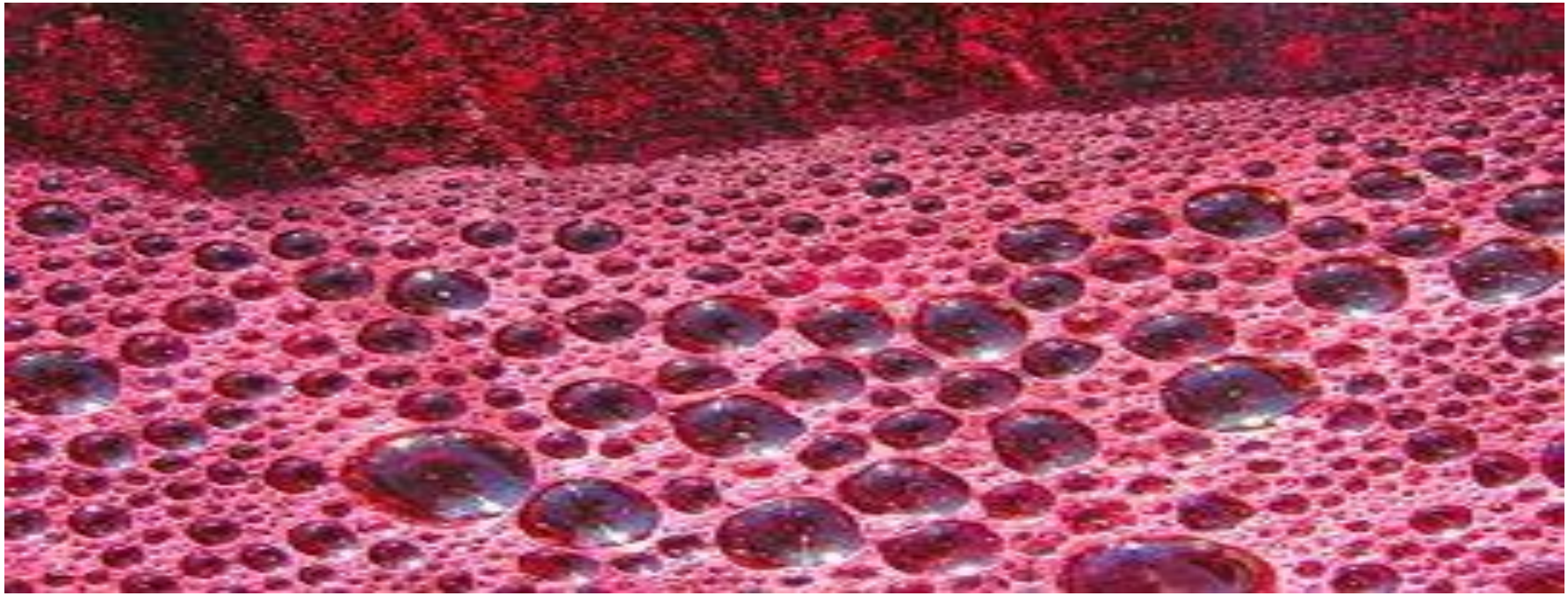


Instructions

- Continue with one quart batches as instructed until you are confident that your SCOBY is awesome enough to handle an upgrade!
- **YOU are the best judge!**
- When you are able to separate a fully formed SCOBY from your original, you can be confident that either is capable of producing quality, raw, homebrewed, lovely, awesome KOMBUCHA!

SECONDARY FERMENTATION

- With clean hands, place your SCOBY in a mason jar and cover with some kombucha (you'll use this to acidify your next brew).
- Remember to pull enough kombucha to start your next batch (10%)



SECONDARY FERMENTATION

- Crush, mince, pulse, grate, etc., your flavoring additions and add directly to your fermentation vessel.
- A *secondary* SCOBY may form and will pull most of your ingredients together during secondary fermentation.
- Taste after 24 hours.
- **YOU are the best judge as to when your kombucha is ready to be packaged!**

SECONDARY FERMENTATION

- 2nd ferments with fruits may not need to be sugared before bottling. Herbs and spices have a better chance of needing it.
- **YOU are the best judge!**

* If you forget to save enough kombucha from your last batch for your next brew, use any unflavored, RAW, store-bought brand. NEVER use apple cider vinegar.

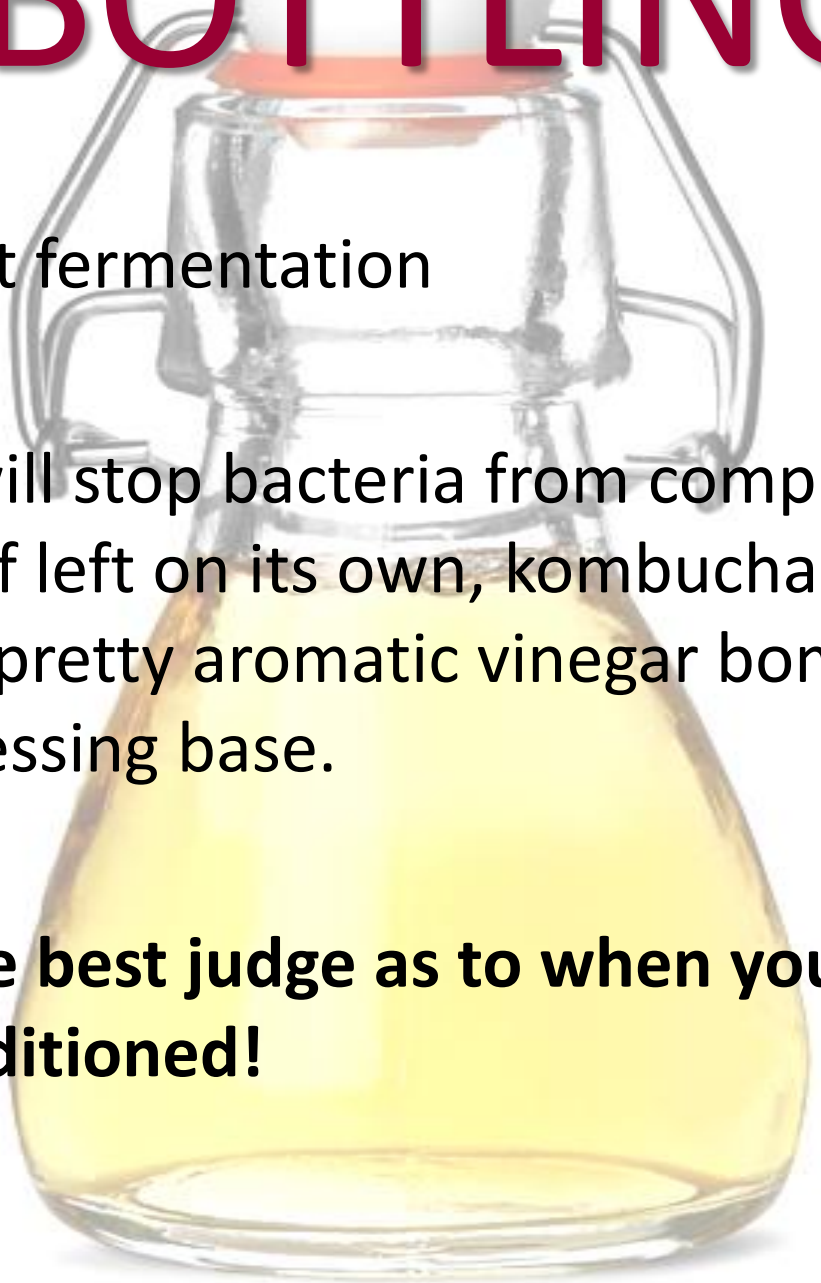
FLAVOR EXPERIMENTATION

BOTTLING

Remember your primary job as a brewer…
KEEP IT CLEAN AND SANITIZED!

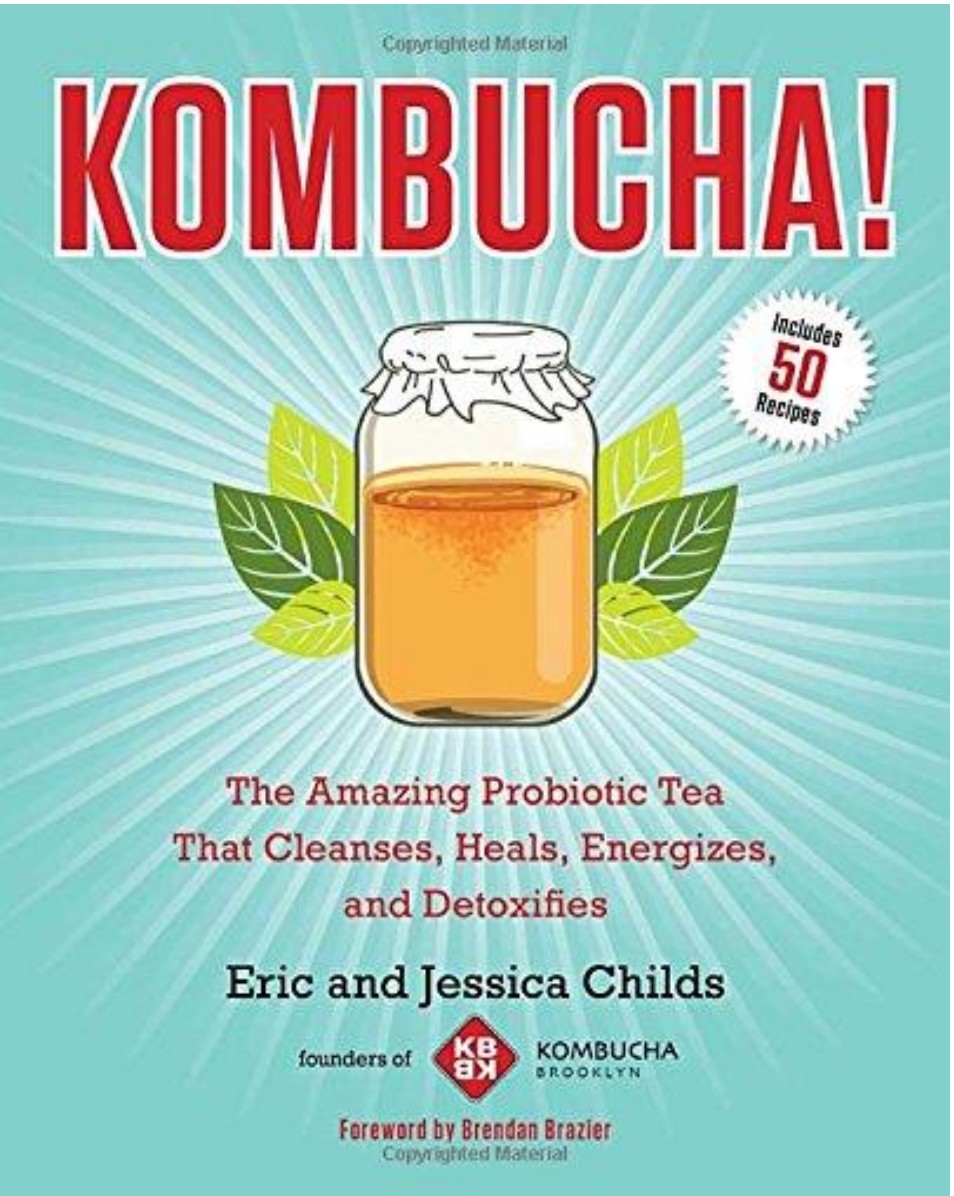
- Use a strainer or cheesecloth to separate your kombucha from the solids.
- Because the volatile nature of kombucha, swing top bottles are highly recommended!
- I've found that whole fruit/juice needs little to no additional sugar. Typical conditioning takes place in 3-5 days. Store them COOL after desired carbonation is reached.
- I've found that added sugar greatly enhances carbonation in kombucha that has had a secondary fermentation with herbs/spices.

BOTTLING



- Chilling will halt fermentation
- Refrigeration will stop bacteria from completing fermentation. If left on its own, kombucha could produce some pretty aromatic vinegar bombs or some lovely salad dressing base.
- **YOU will be the best judge as to when your kombucha has bottle conditioned!**

REFERENCES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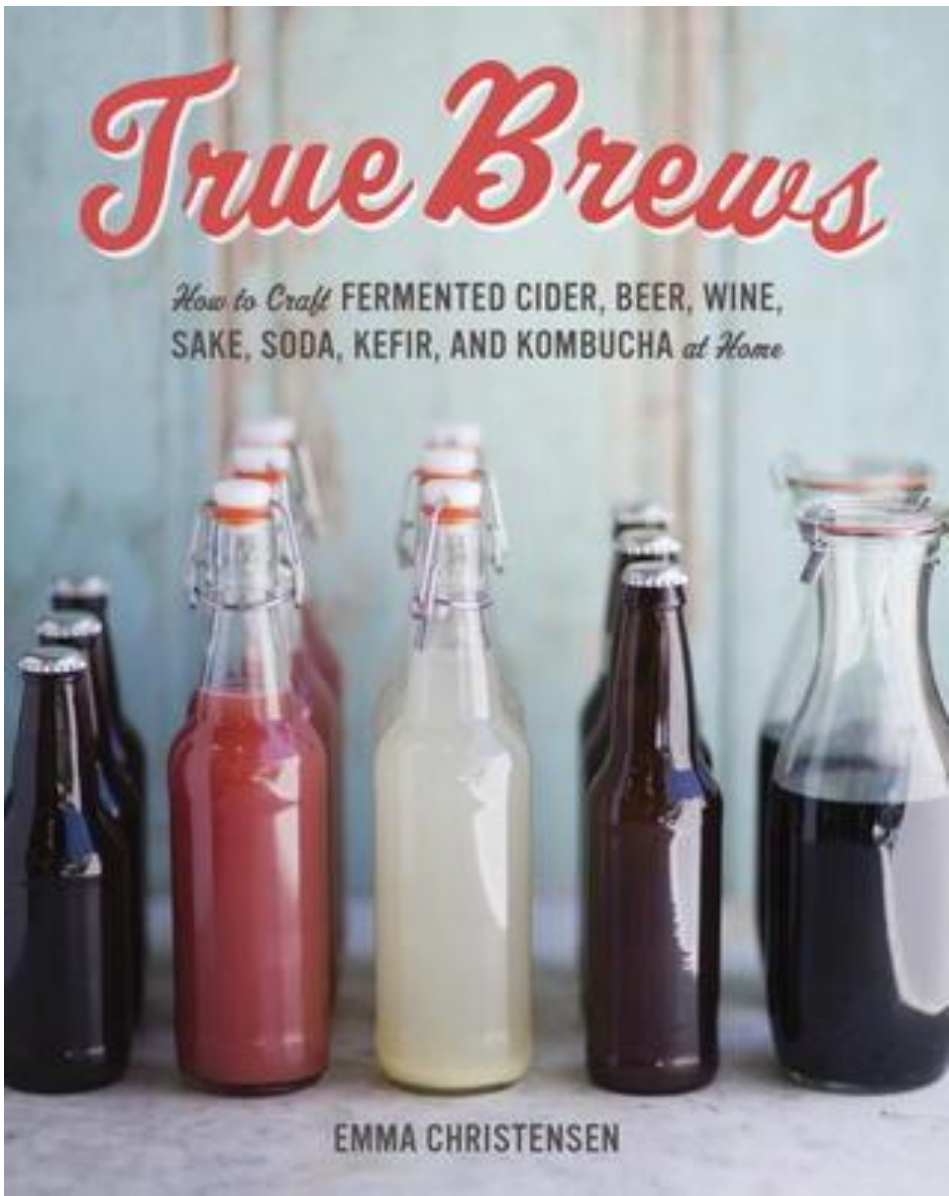
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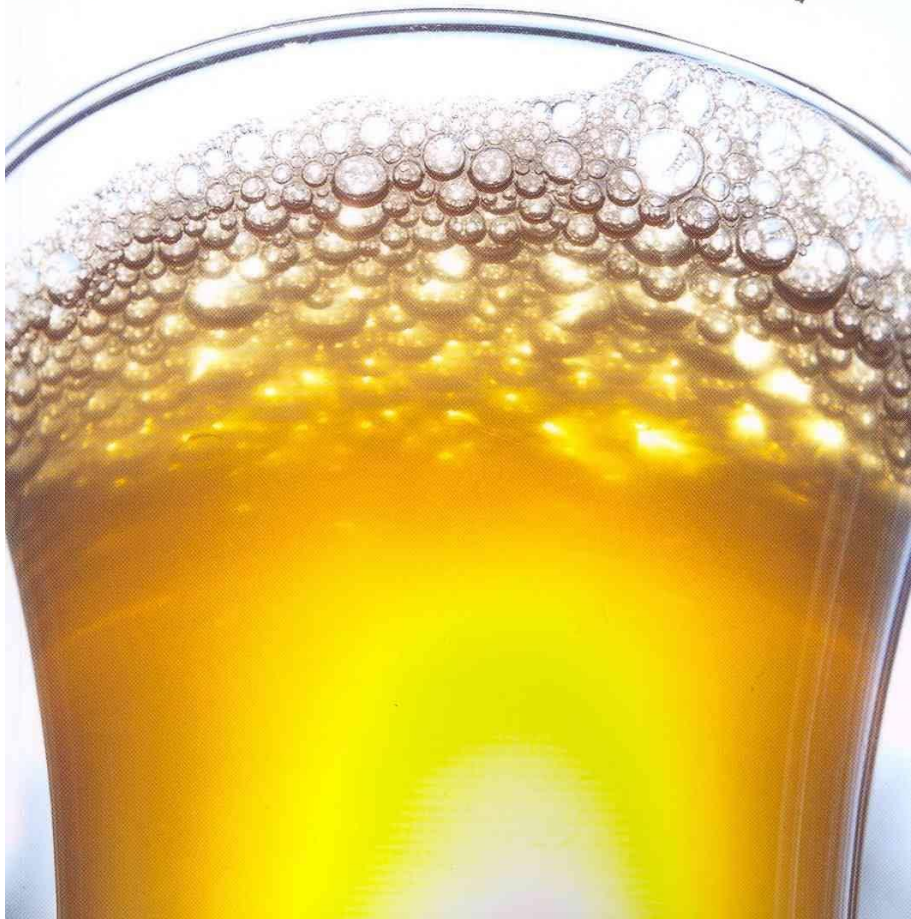

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