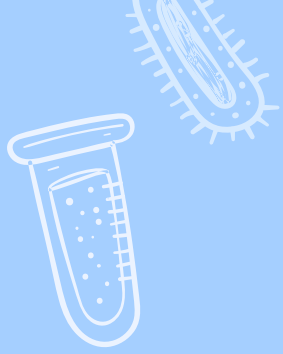




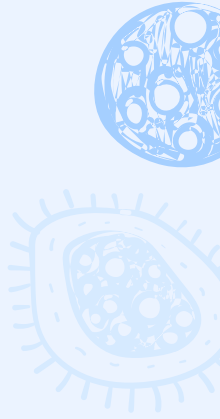
Fermentation Workshop

Make sure to sign in! ->





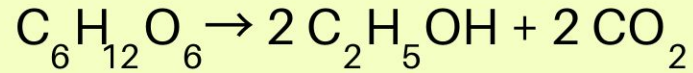
01 What is Fermentation?



What is Fermentation?

The chemical breakdown of a substance by microorganisms to produce energy

glucose \rightarrow ethanol + carbon dioxide + energy



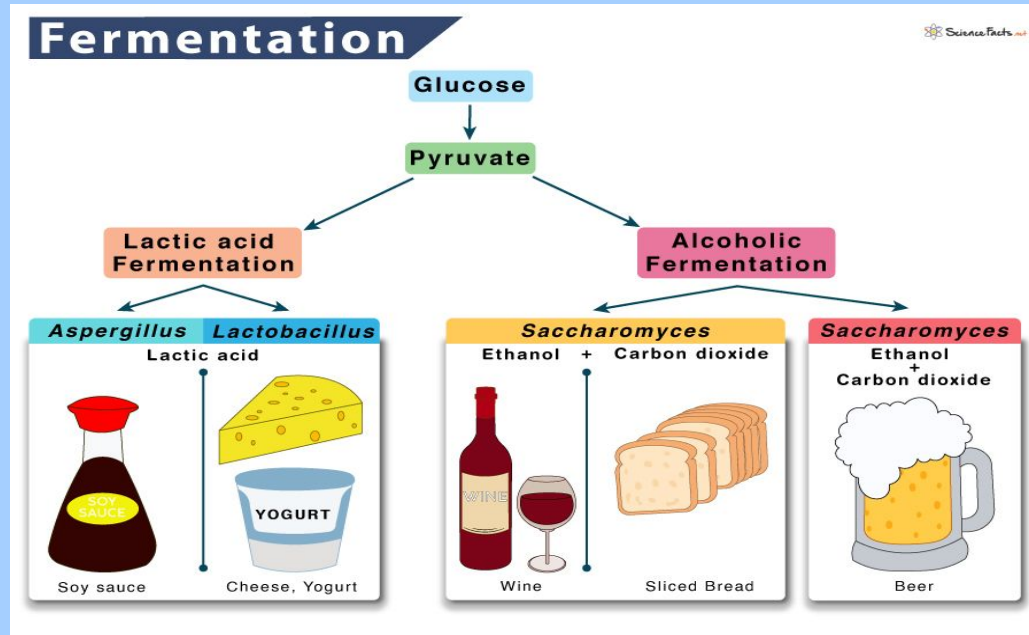
Your body uses fermentation to convert food into energy

There are different types of fermentation!



Different Types of Fermentation

The end product depends on: **type of bacteria** + **type of fermentation**



History of Fermentation

10000-1000 BC

Lots of evidence of fermentation, such as milk, cheese and bread, but origin is not known

500 BC

China creates an antibiotic from moldy soybean curds

1856-1861

Louis Pasteur develops pasteurization

1500's

Fermentation of sauerkraut and yogurt

1928

Discovery of Nisin, antagonism of some lactococci to other LAB shown by Rogers and Whittier

1947

Nisin, a group N inhibitory substance, was concentrated and named by Mattick and Hirsch

1988

FDA Approval for Nisin

1968

FAO/WHO recognize Nisin as safe and legal for use as a biological food preservative

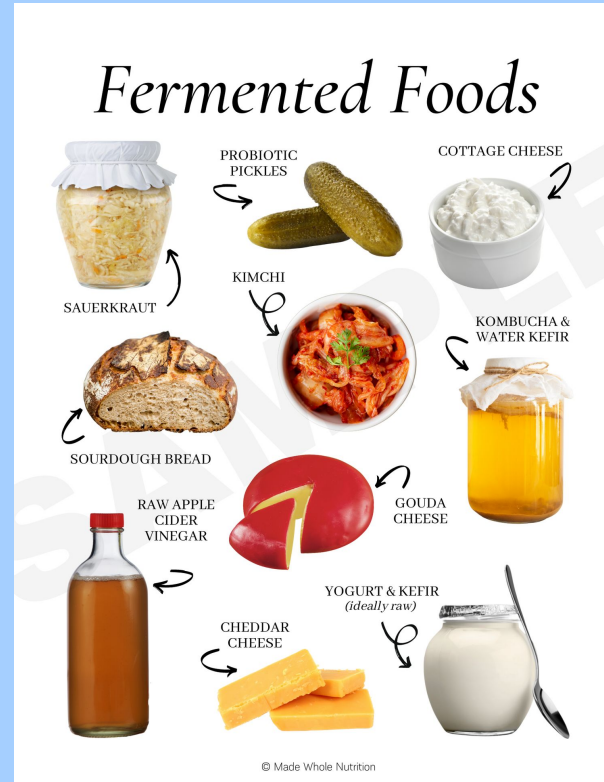
1953

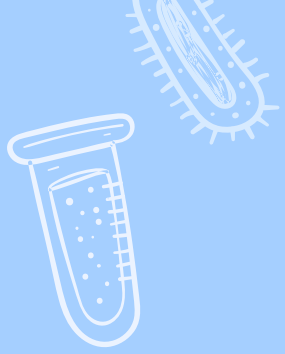
Nisin marketed in England and since approved for use in over 48 countries

Examples of Common Fermented Foods

Today we will be focusing on 3:

- Sourdough Bread
- Kimchi
- Yogurt Products





02 Live Demonstration





Dry Yeast vs Sourdough Starter



Can you taste the subtle sourness?





Dry Yeast vs Sourdough Starter



Saccharomyces cerevisiae

A type of fungi!



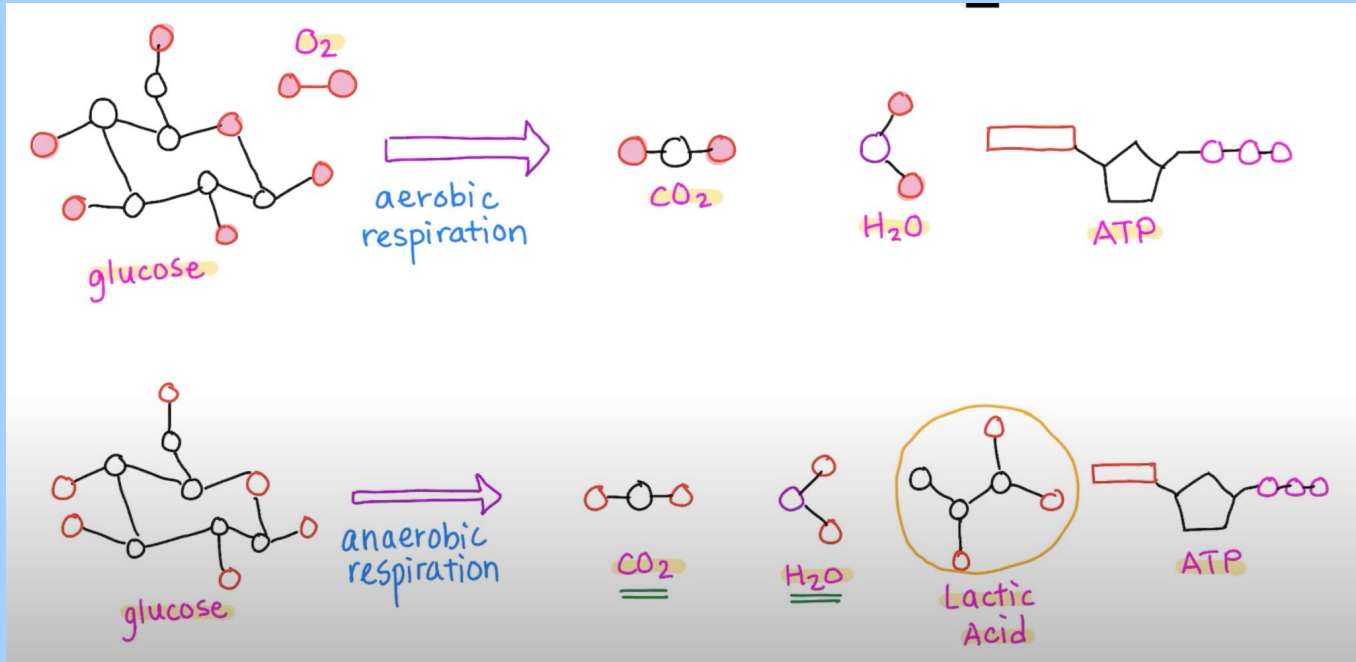
Yeast cells under a microscope!



A mix of wild yeasts and lactic acid bacteria

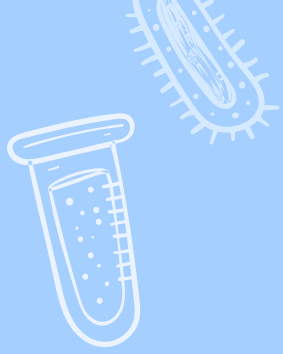


Dry Yeast vs Sourdough Starter



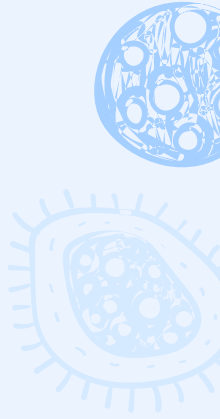
Let's see our starters in action!





03

Fermentation in Asian Foods



Asian Foods that use Fermentation

Japan

Natto (fermented soy beans)



Try a sample from one of our Kimchi batches! (a board member will be around to serve you your sample)

South Asia (sometimes consumed in West Asia and Africa)

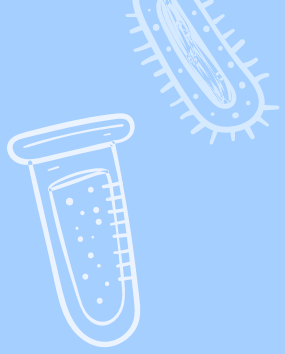
Jalebi



Middle East (West Asia)

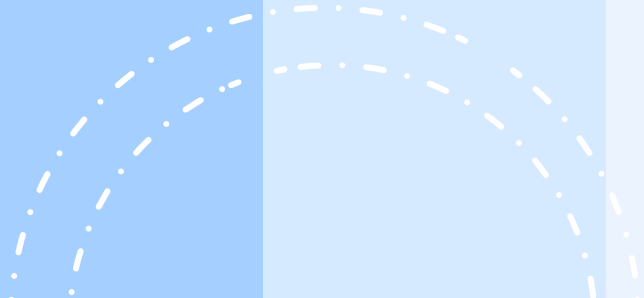
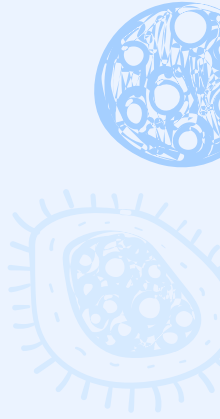
Kefir cheese





04

Make your own Kimchi!



Make your own Kimchi Steps:

1. The Napa Cabbage has already been prepped!
You have your own bag in front of you
2. **Take your bag up to the front of the room** and a board member will scoop you some **ginger, garlic, and gochugaru (red pepper powder)**
3. Grab a **pair of gloves** for Step 5
4. Take your bag back to your seat and **mix it up!**
5. Once mixed, **use gloves to transfer your kimchi into your mason jar**. Make sure to **push it down**
6. Cap your jar and let it ferment for a couple days!



Feel free to name your jar
of kimchi with the sticker!





Signs of Fermentation

Bubbles!

= CO₂ formation



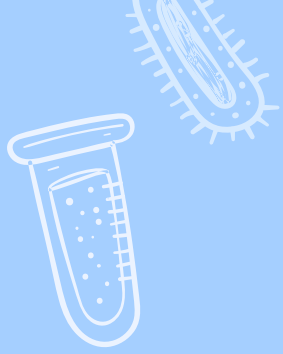
You can also
smell a sour
scent



Taking Care of Kimchi

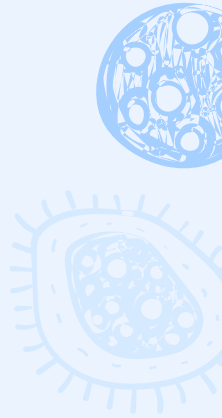
- Let it ferment at **room temperature** for **2 days** (you can let it ferment a couple days longer to make it *more sour!*)
- **Keep refrigerated** afterwards
- Make sure to open the lid **once a day** to let the air escape (this is called **burping**)
- Enjoy your fermented treat!
 - Eat as is, over a bed of rice, or as a side dish





05

Benefits of Fermented Foods



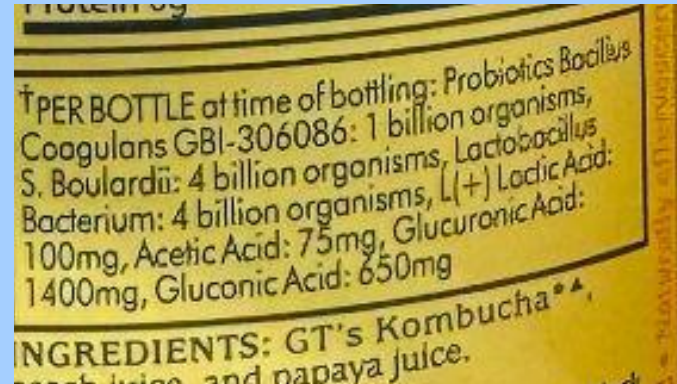
Probiotics

Probiotics – products that include microorganisms that provide health benefits when consumed (not all fermented foods are probiotics!)

Generally, these are known to improve your gut microbiota

Yakult is one example of a probiotic!

You can find information about the probiotic in its label ->



Probiotics

Yakult is one example of a probiotic!
(we are passing them out!)

It contains the microorganism
Lactobacillus casei Shirota at 1.2×10^{10} cfu (colony forming units) / 100ml

Studies have found that this microorganism can improve bowel habits, prevent infection, and modulate immune responses



[Appl Environ Microbiol](#). 2016 Jun 15; 82(12): 3649–3658.

PMCID: PMC4959178

Published online 2016 May 31. Prepublished online 2016 May 6. doi: [10.1128/AEM.04134-15](#)

PMID: [27208120](#)

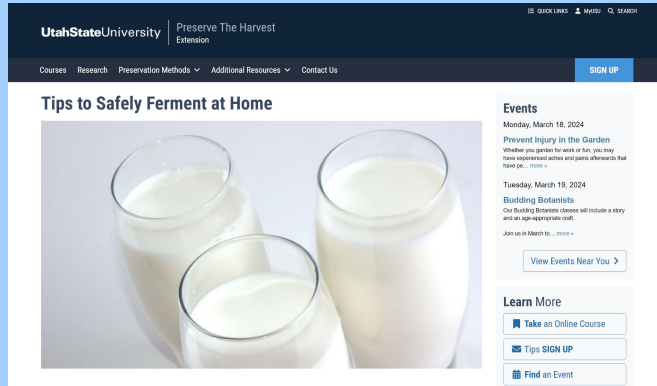
Fermented Milk Containing *Lactobacillus casei* Strain Shirota Preserves the Diversity of the Gut Microbiota and Relieves Abdominal Dysfunction in Healthy Medical Students Exposed to Academic Stress

[Akito Kato-Kataoka](#),^a [Kensei Nishida](#),^b [Mai Takada](#),^a [Mitsuhisa Kawai](#),^a [Hiroko Kikuchi-Hayakawa](#),^a [Kazunori Suda](#),^a [Hiroshi Ishikawa](#),^a [Yusuke Gondo](#),^a [Kensuke Shimizu](#),^a [Takahiro Matsuki](#),^a [Akira Kushiro](#),^a [Ryoutaro Hoshi](#),^c [Osamu Watanabe](#),^c [Tomoki Igarashi](#),^c [Kouji Miyazaki](#),^{2a} [Yuki Kuwano](#),^b and [Kazuhiro Rokutan](#)^b

J. Björkroth, Editor
University of Helsinki



Additional Resources for your Fermentation Adventure!



Tips to Safely Ferment at Home

Article containing helpful tips so you can get the most out of your fermentation adventure!

- <https://extension.usu.edu/preserve-the-harvest/research/tips-to-safely-ferment-at-home>



Vine Bakery

Local Gainesville
Sourdough Bakery (where
Mia got her starter!)



Sign in here in case you missed it!



Thanks for coming !

