



Sourdough Bread



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The RISE of Sourdough (*pun intended*)

- Disclaimer
- Popularity
 - Prized for sensory characteristics
- Oldest bread – 3500 BCE
- (Rothe et al., 1973; Samuel, 1996)

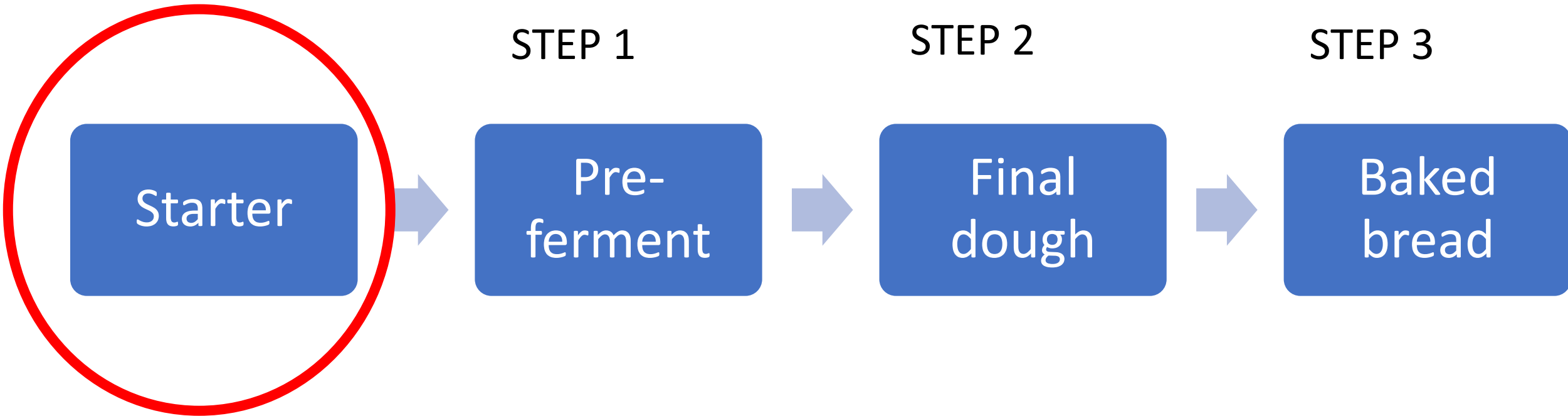


Sourdough – a mixture of many names

- Lavin
- Polish
- Biga
- Barm
- Pate Fermentee
- Mother
- Chef
- Sponge
- Starter



Making Sourdough Bread - Overview



Distinctive Characteristics of Sourdough bread

- Sour taste
- Crumb vs Crust
- lactic acid, acetic acid and volatile compounds (and flavour precursors)
- Broader range flavour compounds (196)

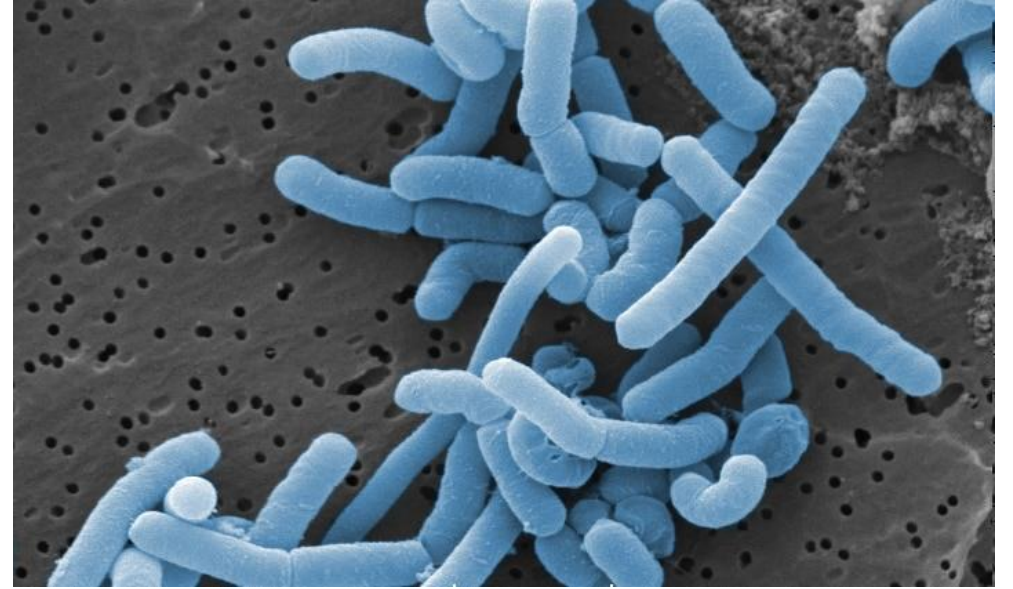
To date, 196 volatile compounds:
43 aldehydes,
35 alcohols,
33 esters,
19 ketones,
14 acids,
13 furans,
11 pyrazines,
2 lactones,
2 sulfurs,
21 others and alkanes.

Fermentation Process

- So many environmental and ecological factors to consider and control:
 - Temperature, pH, redox potential, ionic strength, dough composition, dough yield, and microbial enzymatic reactions
- Its all about microbes!
- Symbiotic Lactic Acid Bacteria (LAB) and Wild Yeast
- Ratio of LAB to yeast ranges from 10:1 to 100:1

Lactic Acid Bacteria

- Produce lactic acid and carbon dioxide gas (CO_2) – by products
- 50 different species sourdough LAB (De Vuyst and Neysens 2005).
- *Lactobacillus*,
 - *L. sanfranciscensis*,
 - *L. brevis* and
 - *L. plantarum* (Gänzle et al. 2007).
- Optimum temp 30 – 40 °C
- (Hammes and Vogel 1995).
- Primary role – sour taste and leaven bread



Source <https://www.thermofisher.com/blog/food/lactic-acid-bacteria-the-food-friendly-source-for-antimicrobial-bacteriocins/>

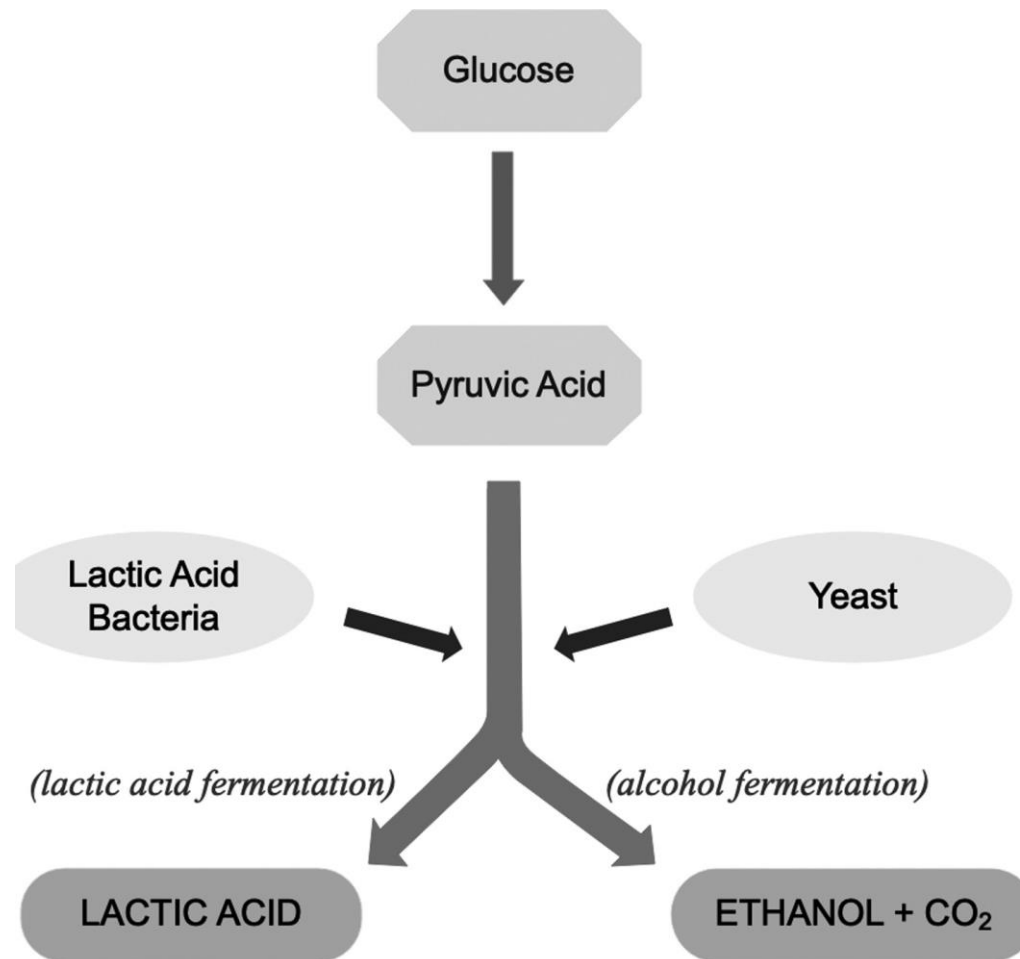
Wild Yeast

- Single-celled facultative microbes
- Convert simple sugars into ethanol and CO₂ under anaerobic conditions
- Primary roles
 - leaven the dough
 - flavour and aroma production
- 20 different species of yeasts (De Vuyst and Neysens 2005).
- *Saccharomyces* and *Candida* (Corsetti and Settanni 2007).
- Optimum temperature for growth = 30 - 35 °C (Walsh and Martin, 1997)
- Create a good balance between LAB and Yeast < 30 °C

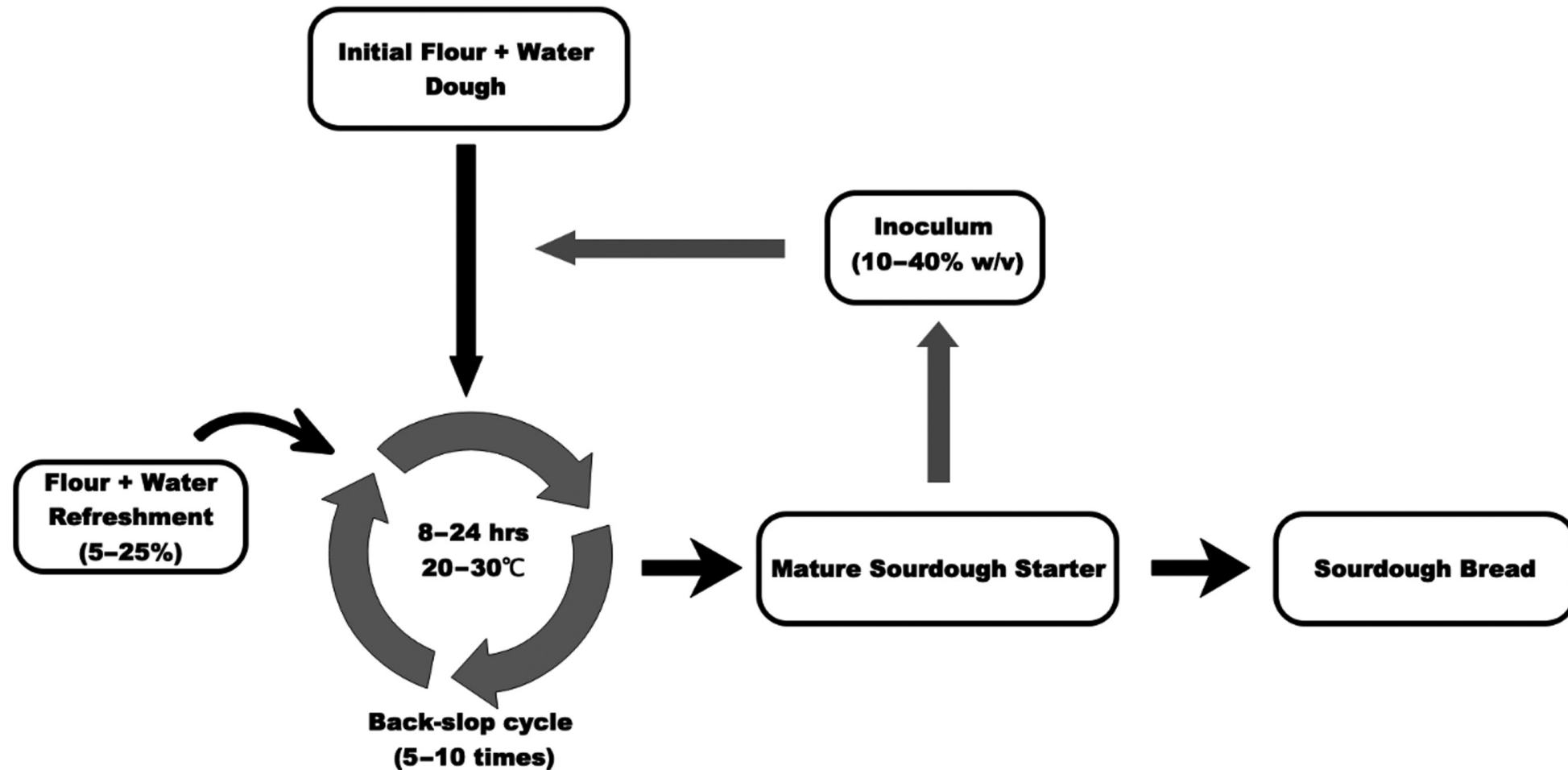


Source: <https://www.growforagecookferment.com/how-to-make-a-wild-yeast-starter/>

Fermentation Pathways



Back Slopping – Feeding the Microflora



Conclusions

- Temperature control < 30 °C
- pH 4.0
- Number of back slops - 5 -10



Source

<https://www.dispatch.com/storyimage/OH/20190619/ENTERTAINMENTLIFE/190618395/AR/0/AR-190618395.jpg>

Thank you!

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