



# 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)

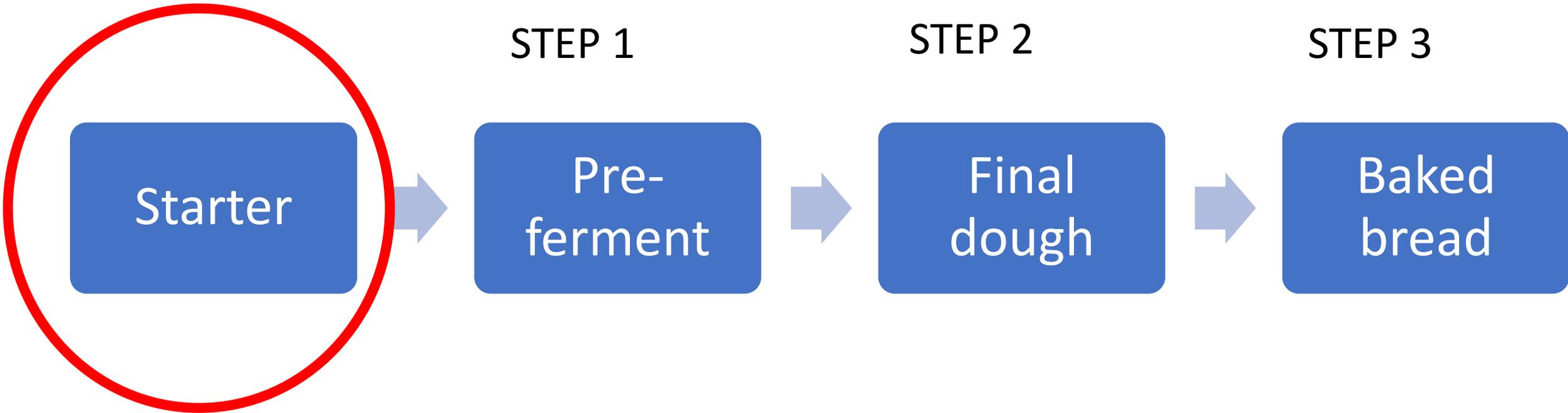


# Sourdough – a mixture of many names

- 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)

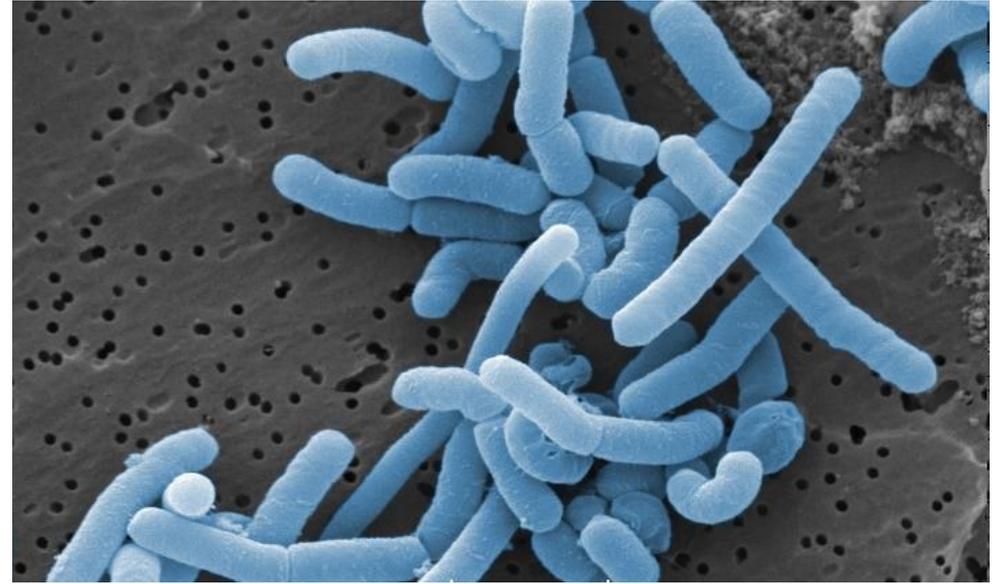
To date, 196 volatile compounds:  
43 aldehydes,  
35 alcohols,  
33 esters,  
19 ketones,  
14 acids,  
13 furans,  
11 pyrazines,  
2 lactones,  
2 sulfurs,  
21 others and alkanes.

# 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<sub>2</sub>) – 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/>

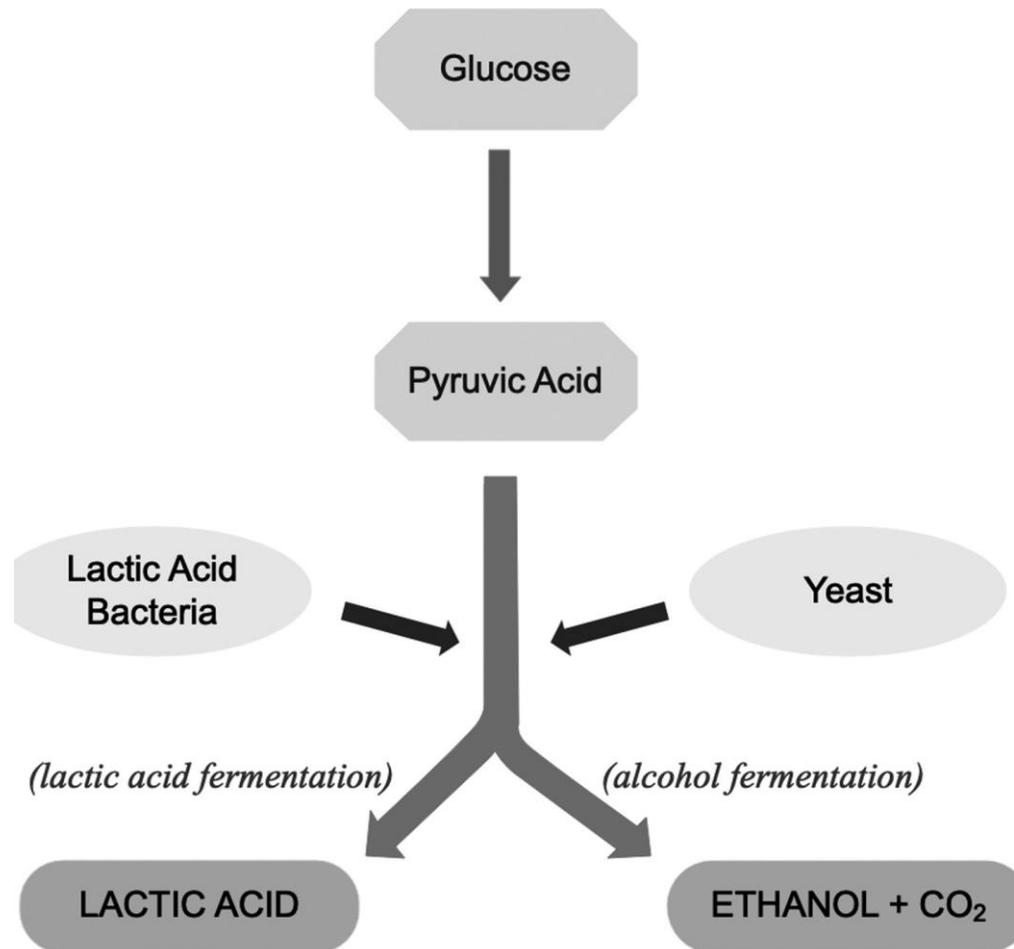
# Wild Yeast

- Single-celled facultative microbes
- Convert simple sugars into ethanol and CO<sub>2</sub> 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

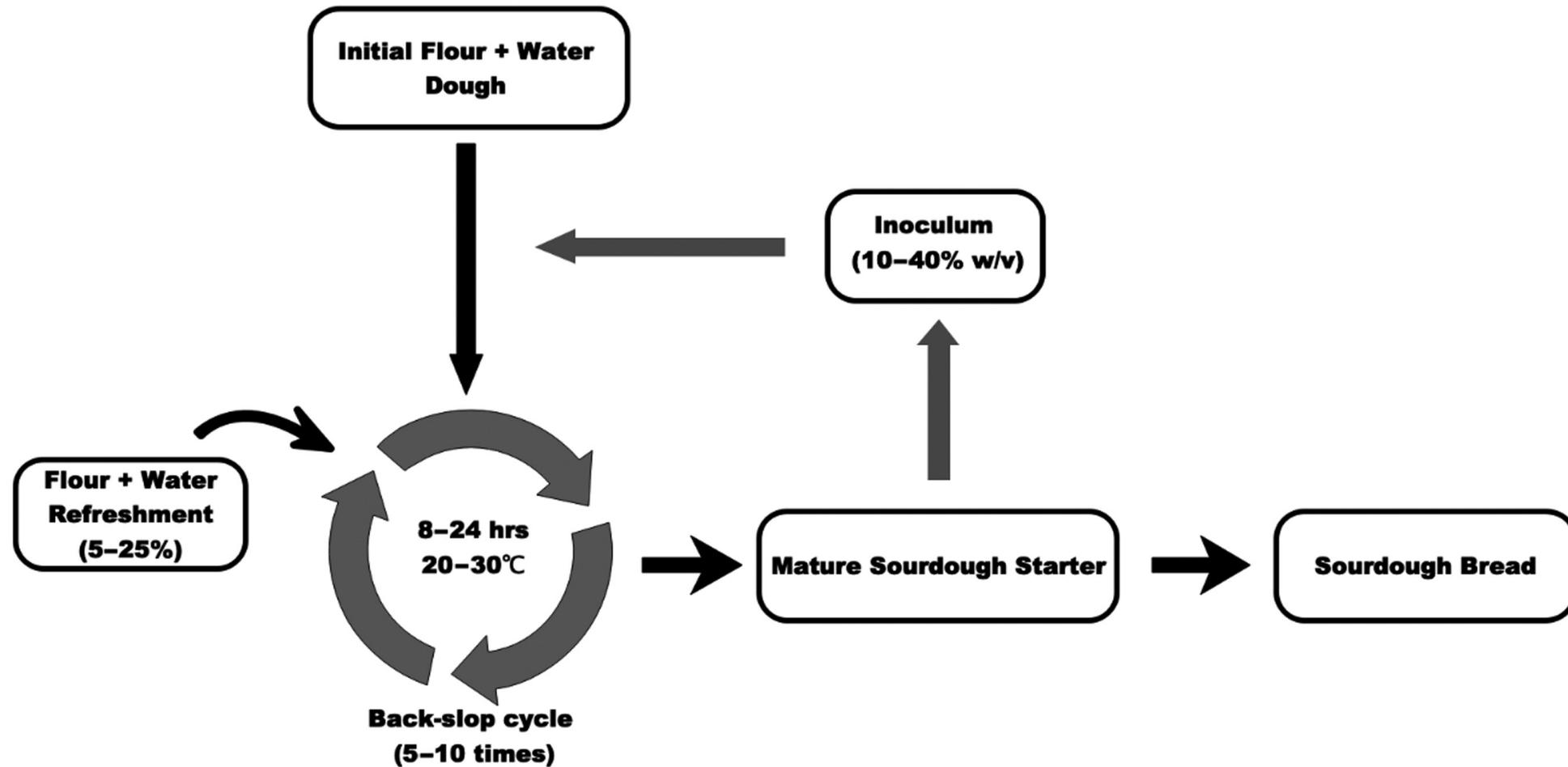


Source: <https://www.growforagecookferment.com/how-to-make-a-wild-yeast-starter/>

# 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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