Summary & PowerPoint

"Countertop Science:" Sourdough as a Scalable System for Citizen Science

People all over the world bake naturally leavened sourdough bread. For these bakers, an important part of our human culture revolves around microbial culture. Yet little is known about the microbial cultures that make bread a nutritional boon to human cultures worldwide. We have addressed that void with several citizen science efforts. Our first, global, effort engaged 563 acetic acid bacteria - far greater diversity than was previously known to exist in sourdough communities - as well as the specific global and baker specific factors that appear to shape that diversity. Our results laid the foundation for additional citizen science projects, to further engage the public and especially middle school students to grow and study their own edible microbial gardens. By measuring the height, bubble production, pH, and aroma of starters fed different flours, students contribute to a greater understanding of microbial ecology and link microbial metabolic traits to gastronomic attributes of bread. These activities support and enrich public education, just as each citizen scientist's data further enriches our understanding and enjoyment of bread.

Learning Objectives

- Link specific microbes to sourdough starter activity and bread flavor
- Identify factors that shape microbial diversity in sourdough
- Recognize scalable opportunities for public engagement in scientific inquiry

Presenter
Erin McKenney, North Carolina University

Presentation Time
Tuesday, February 26, 2019
1:25 pm - 2:00 pm

Session
Breakout 4

"Countertop Science": Sourdough as a scalable system for citizen science

Erin McKenney, MS, PhD
NC Museum of Natural Science

We depend on microbes.

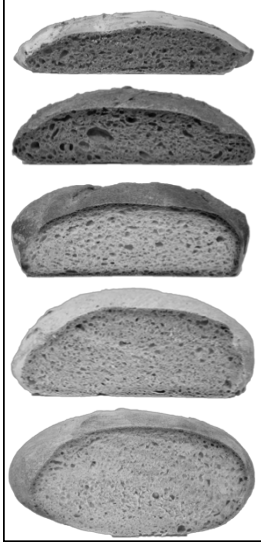
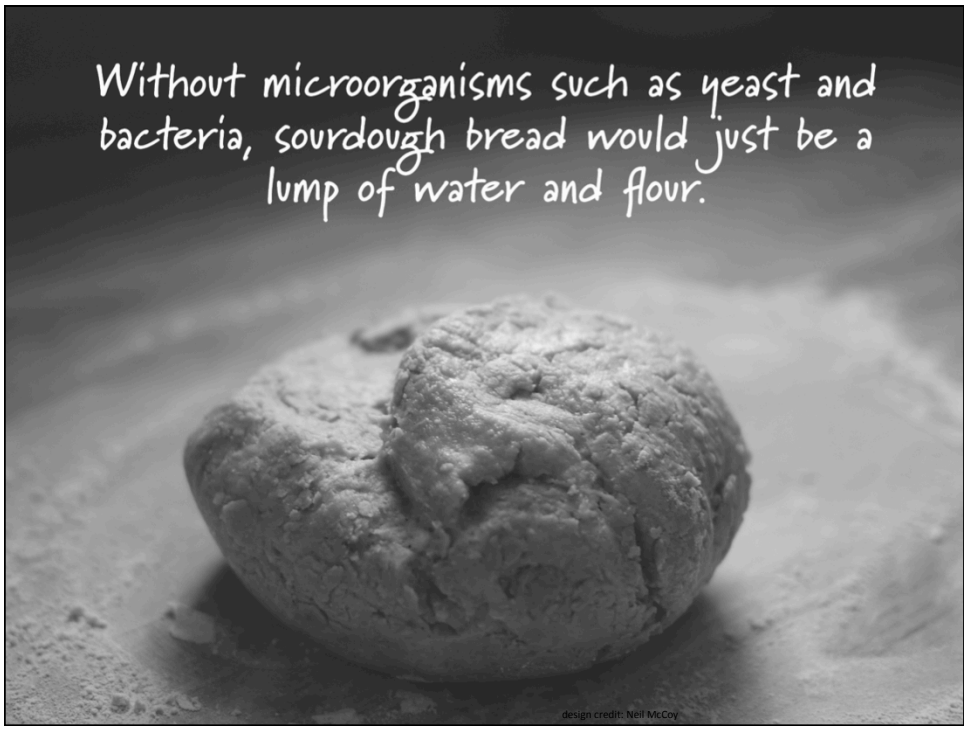


photo credit: Erin McKenney (breads) and Lauren Nichols (fermented foods)

Bread is a historic staple.



The Sourdough Project

Communities, interactions, & function

photo credit: Lauren Nichols

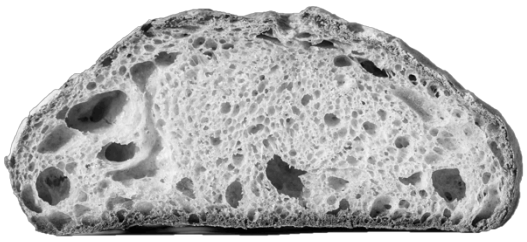
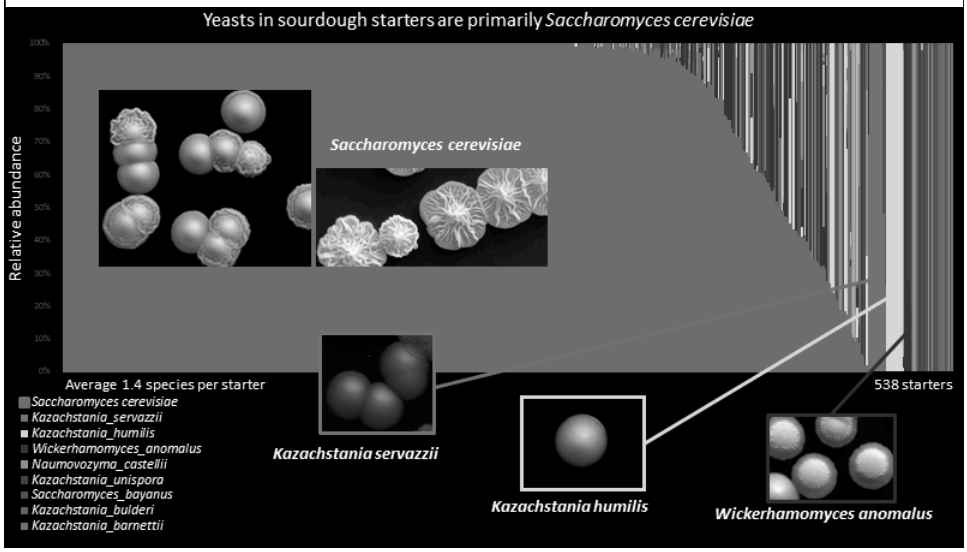


photo credit: Lauren Nichols

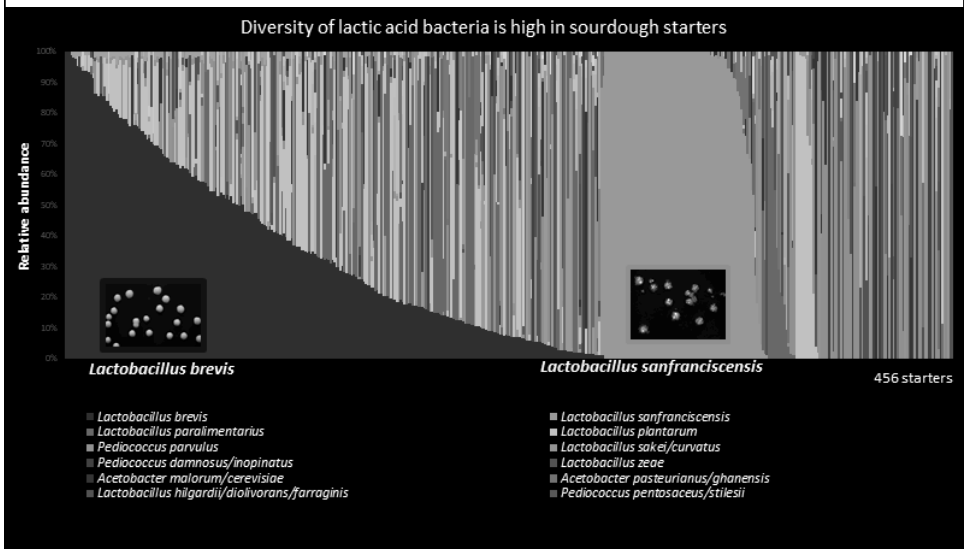
Who's there (or not), and why?

COMMUNITY STRUCTURE

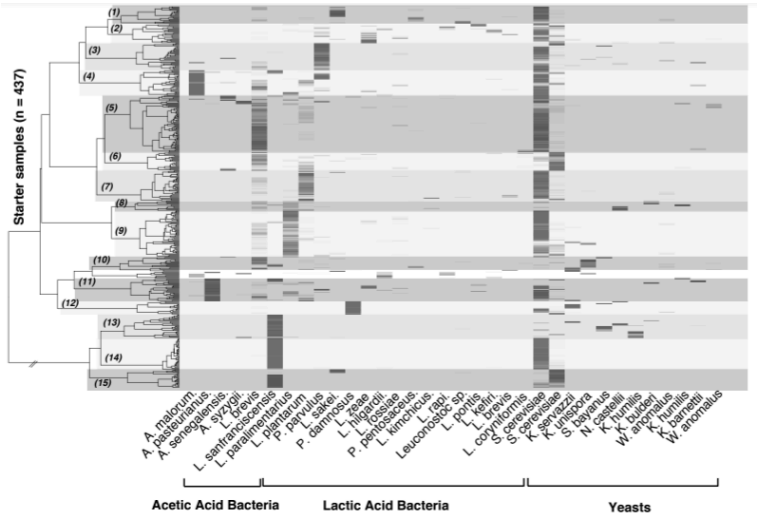
Yeast vary geographically.



Bacteria vary by house.



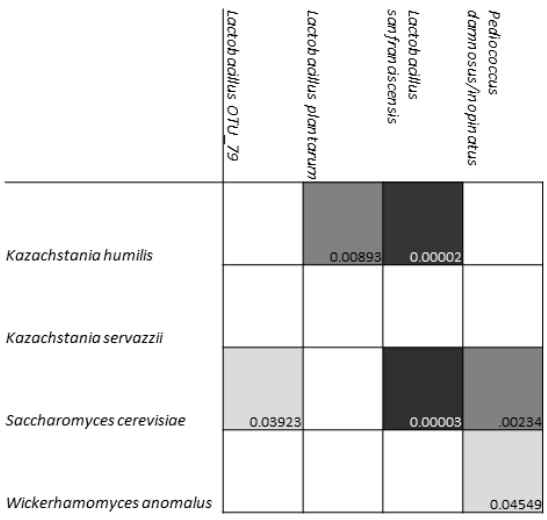
Community structure is (un)predictable.



Do microbial interactions explain community structure?

CO-OCCURRENCE & COMPETITION

Co-occurrence patterns



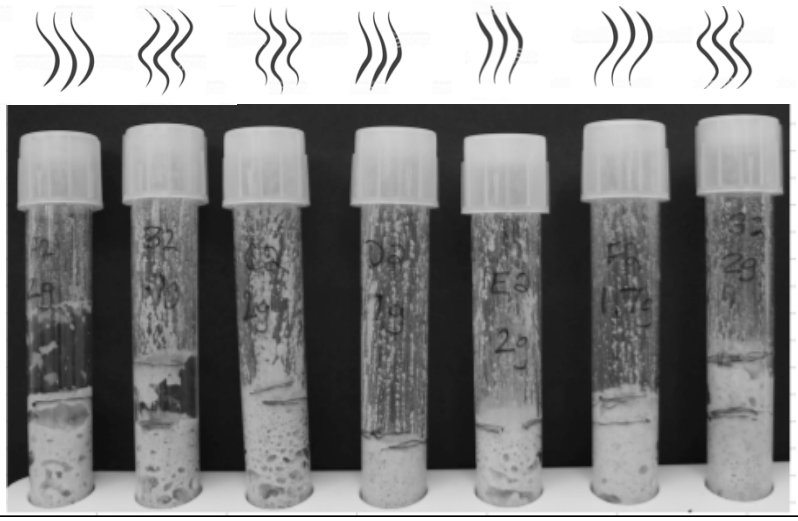
Competition for maltose

Micro-starters:
two enter, one wins.

Do different microbes make different breads?

FUNCTIONALITY

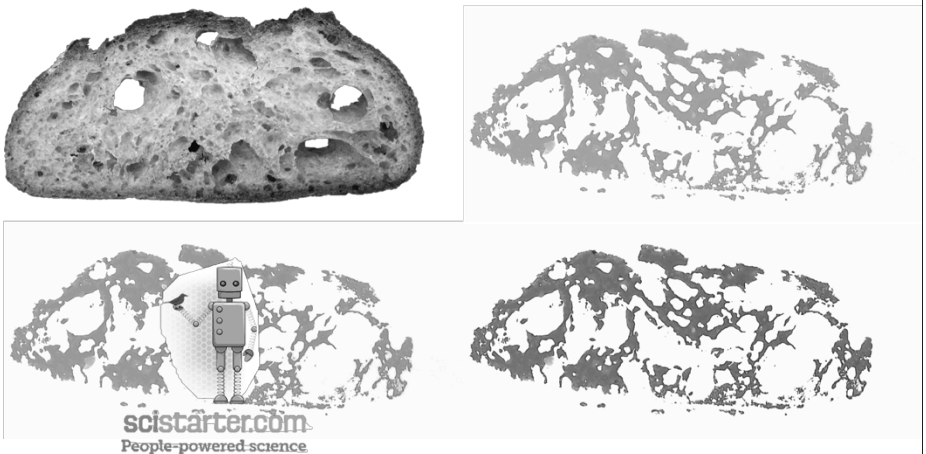
Aromatic micro-starters



Sourdough for Science

Over 200 students in 2 counties!

New Year, New Bread



Join our citizen science projects!

- Sourdough for Science
  - studentsdiscover.org/lesson/sourdough-for-science
  - scistarter.com/project/19378-Sourdough-for-Science
- New Year, New Bread
  - studentsdiscover.org/lesson/new-year-new-bread
  - scistarter.com/project/19473-New-Year-New-Bread

Thank you!

How to contact me:

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