

Upcycling of whey to produce craft organic acid-based beverages or vinegar with novel yeast and bacterial co-cultures

ALYSSA THIBODEAU

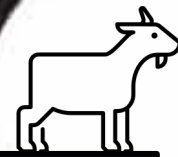
CURTIN LAB

Oregon State University

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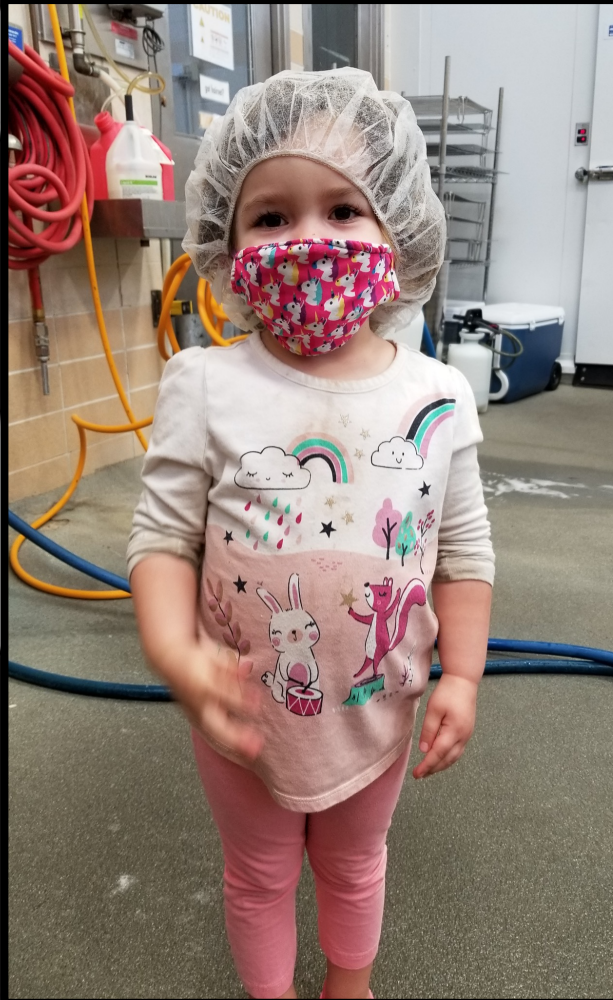
About me



- Born and raised - Mesa, AZ
- Mother
- Mixed martial artist

Dairy experience:

- Save Your Dairy
- The Portland Creamery
- RKS Farms
- La Mariposa Cheese
- Don Froylan Creamery
- Caprikoda Croft
- Turtle Creek Farm
- Beaver Classic Cheese



Education



Associates in Science (2017)



Bachelors in Food Science and Technology
(2022)

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WHY is this important?

- Whey by-product is the largest effluent of dairy industry
- Current uses of whey undervalue its nutrient dense composition, are energy consumptive, and require extensive equipment



Whey based beverages

WHEY KEFIR, WHEY VINEGAR, WHEY WINE,
WHEY VODKA, ETC...

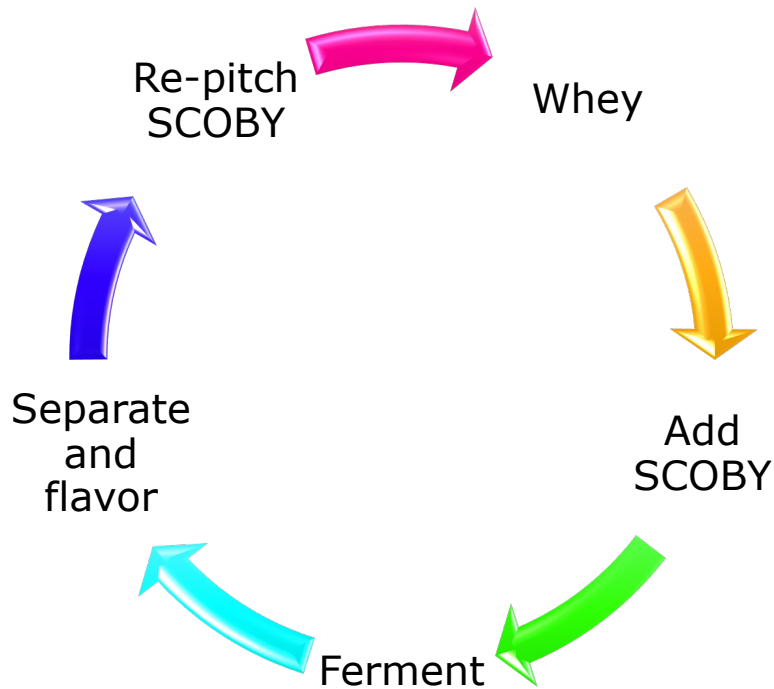
- Little scientific literature
- Final composition is ethanol, acetic acid, or lactic acid

WHY NOT WHEY KOMBUCHA???

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Purpose



- Develop SCOBY system for fermenting whey
- Evaluate potential to create functional beverage
- Refine sensory characteristics

Background research

- *Kluyveromyces* sp. and lactic acid bacteria (LAB) are most common cultures used to ferment lactose
- *Brettanomyces* sp. and acetic acid bacteria (AAB) exist symbiotically in kombucha SCOBY

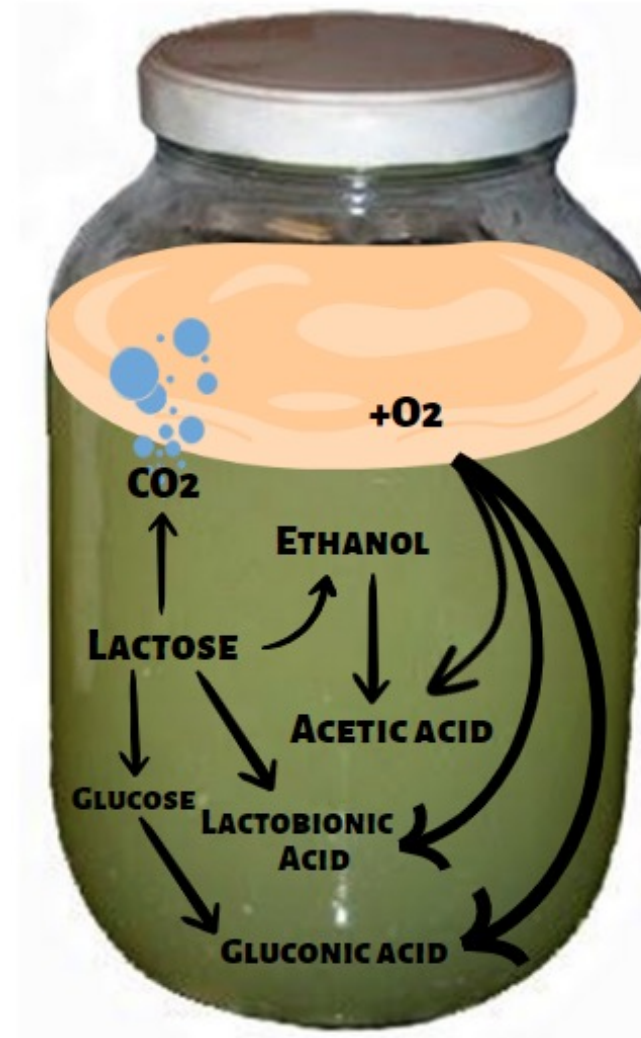
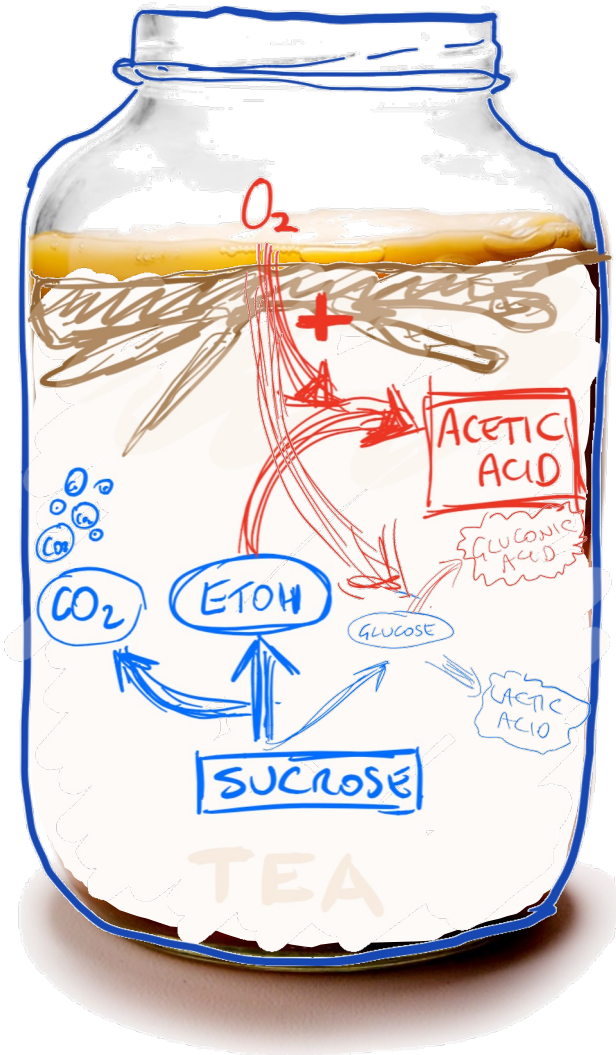
- *B. anomalus* can utilize lactose and ferment whey in both oxic and anoxic conditions
- Beta-glucosidase is putative enzyme responsible for lactose utilization by *B. anomalus*



Kombucha vs. Whey Fermentation



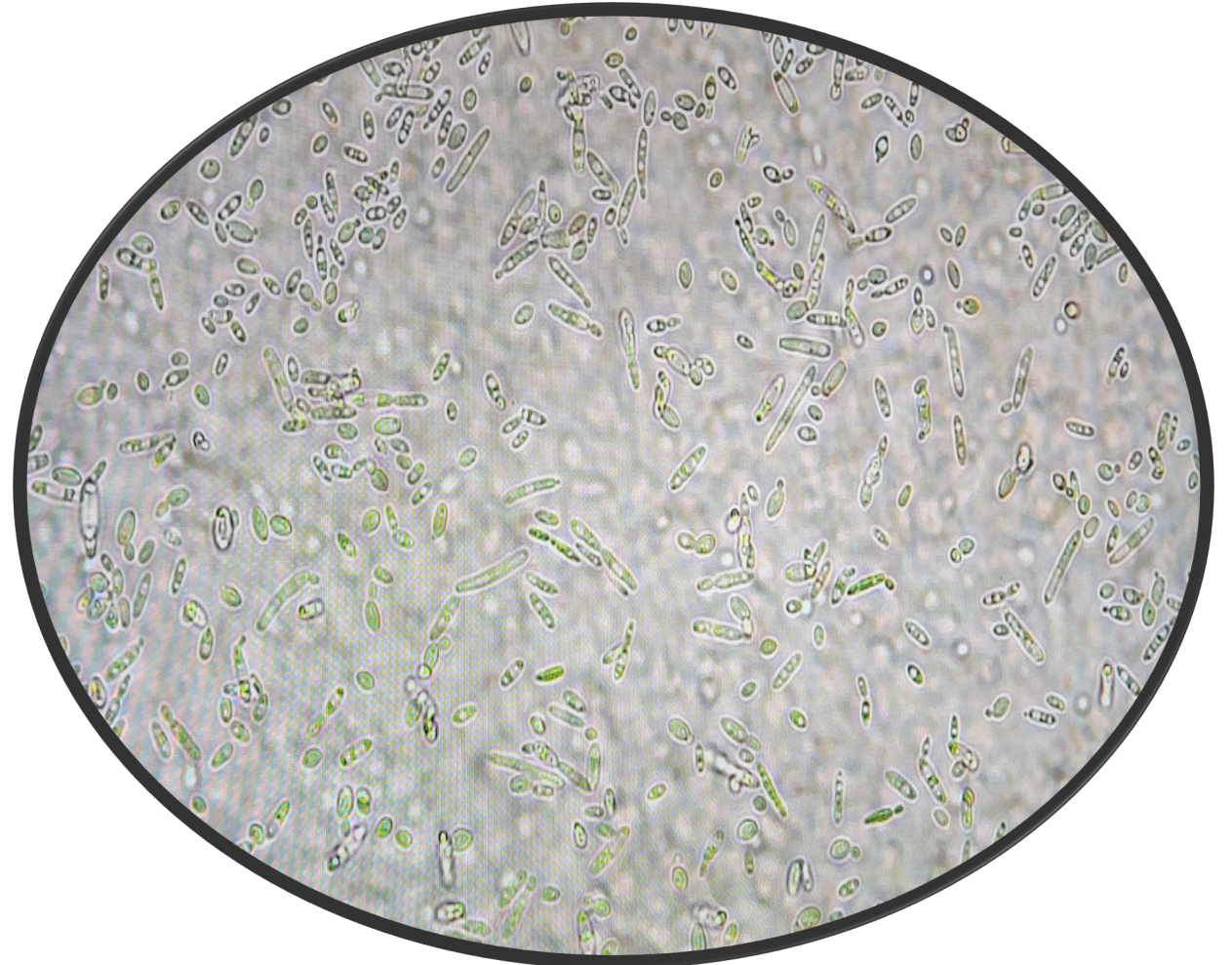
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unbottled.

Knowledge gaps

- Do all *B. anomalus* cultures ferment lactose?
 - 10/10 tested grow on lactose
 - Next: testing lactose fermentation
- Can a *de novo* or established SCOBY system be used to ferment whey?





Thank you for your attention!

Questions?

