



Salmonella Isolate Recovery Project

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PulseNet/OutbreakNet East Coast Regional Meeting

1/17/19

Our Project Leads/ Collaborators:

- **Project Leads: Katie Dillon, Jo Williams, Andrew Huang**
- **EDLB**
- **Association of Public Health Laboratories (APHL) Isolate Recovery Subcommittee**
- **Oak Ridge Institute for Science and Education (ORISE)**
- **CO Department of Public Health & Environment, Laboratory Services Division**
- **Los Angeles County Department of Public Health**
- **MN Department of Health, Public Health Laboratory**
- **TN Department of Health**
- **University of IA, State Hygienic Laboratory**



Katie Dillon

Purpose

- The Problem(s)
 - CIDTs do not yield isolates, which are needed for surveillance activities
 - SPHLs burdened with doing isolations
- The Solution
 - Provide recommendations on *Salmonella* isolate recovery from disease-state stools for the SPHLs

Overview

- Background
- Purpose
- **Phase 1**
- **Phase 1.1 “Hot Truck”**
- **Phase 2 (preliminary results)**
- Next Steps



Phase 1

What transport temperature, transport media, and plating media work best for *Salmonella* recovery?

Oranienburg

Newport

Unspiked



10^4

10^2

US



Cary-Blair



GN Broth



22°C



4°C

4

days

8

days

14

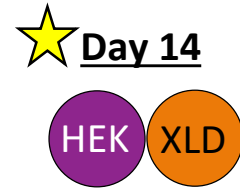
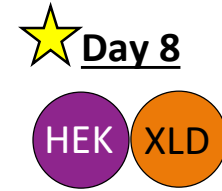
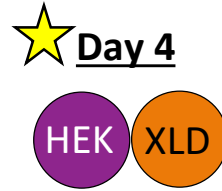
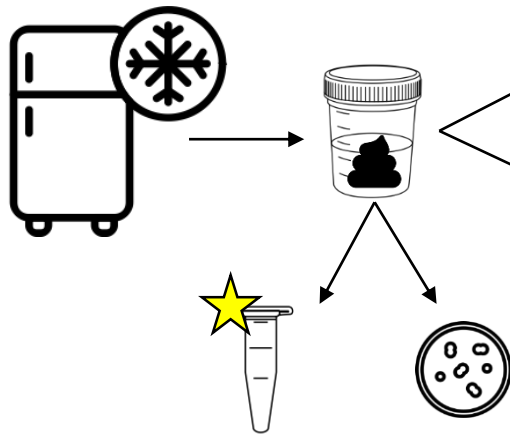
days



Hektoen

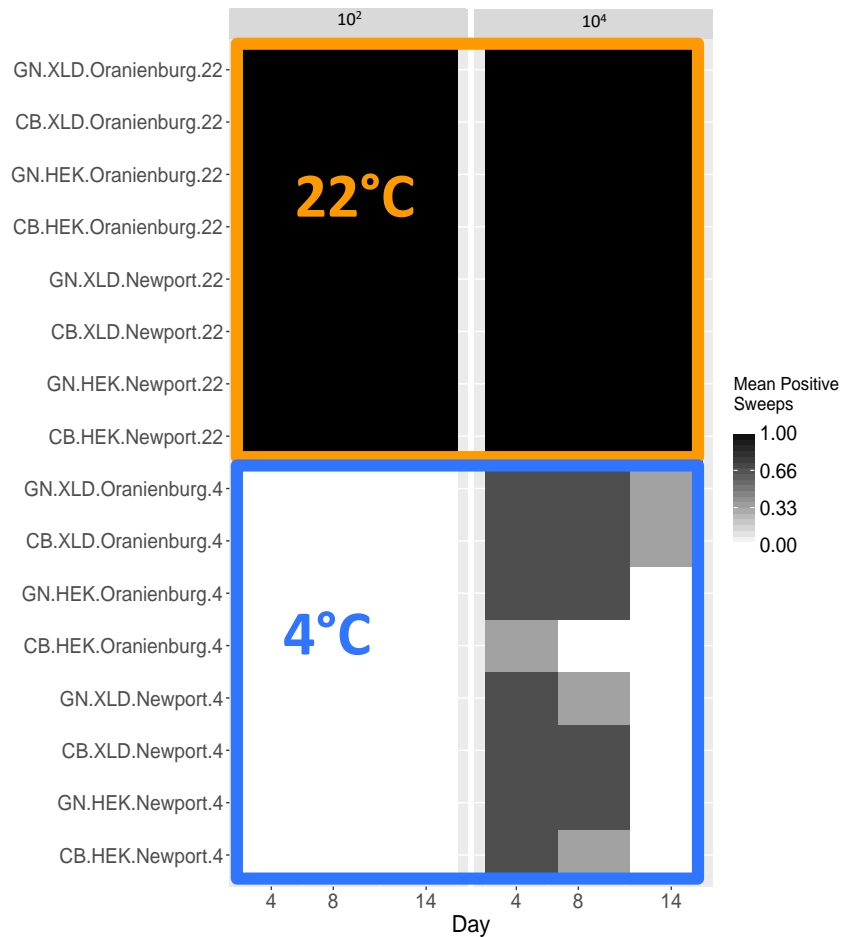


XLD

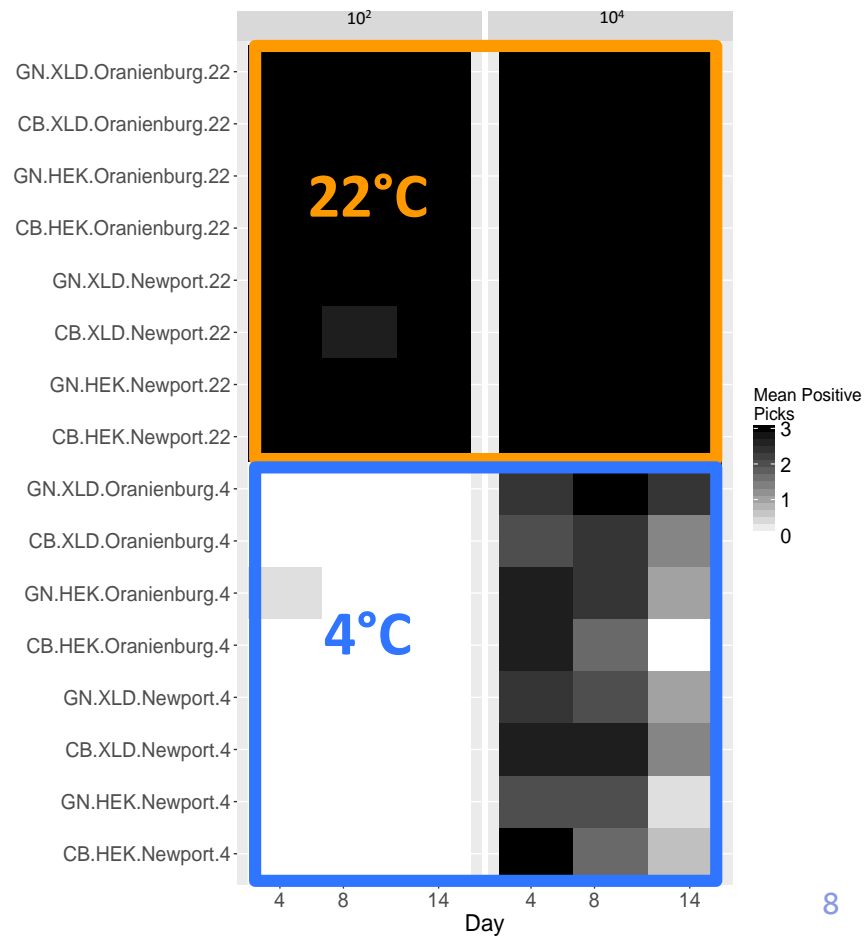


<u>Seeded:</u> 3 colony picks 1 sweep	<u>Unseeded:</u> 6 colony picks 1 sweep
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Sweeps



Picks



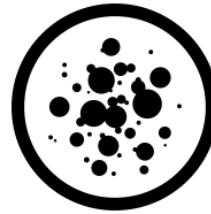
Outcomes

- No significant difference between transport media or plating media
- Only difference seen with storage temperature

Preliminary Recommendations:



Cary-Blair is more widely used



Hektoen has a longer shelf-life



Recovery best when specimens transported/stored at 22°C



Phase 1.1 “Hot Truck”

How does transport temperature during warmer months affect *Salmonella* isolate recovery?

Phase 1.1 “Hot Truck”: Goals

- Determine optimal
 - Transport temperature during warmer months
- TRIPLICATE

Oranienburg



10^4

Newport



10^2

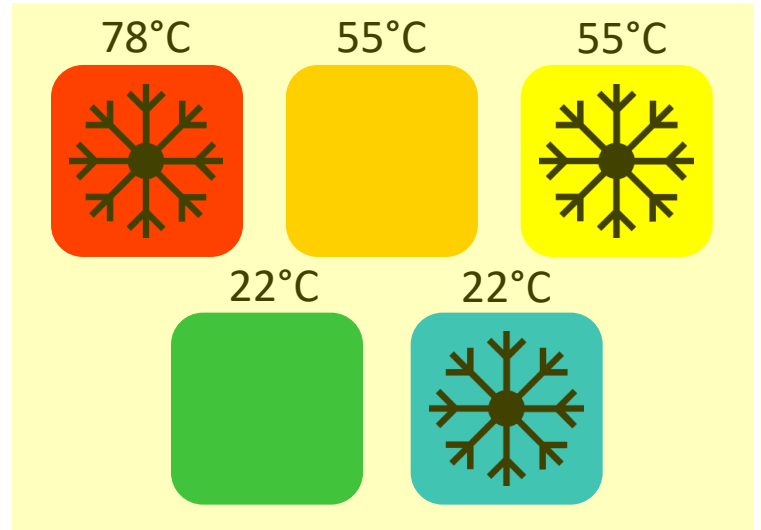
Unspiked



US



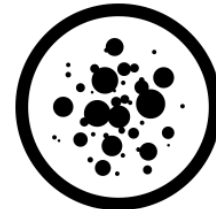
Cary-Blair



4
days

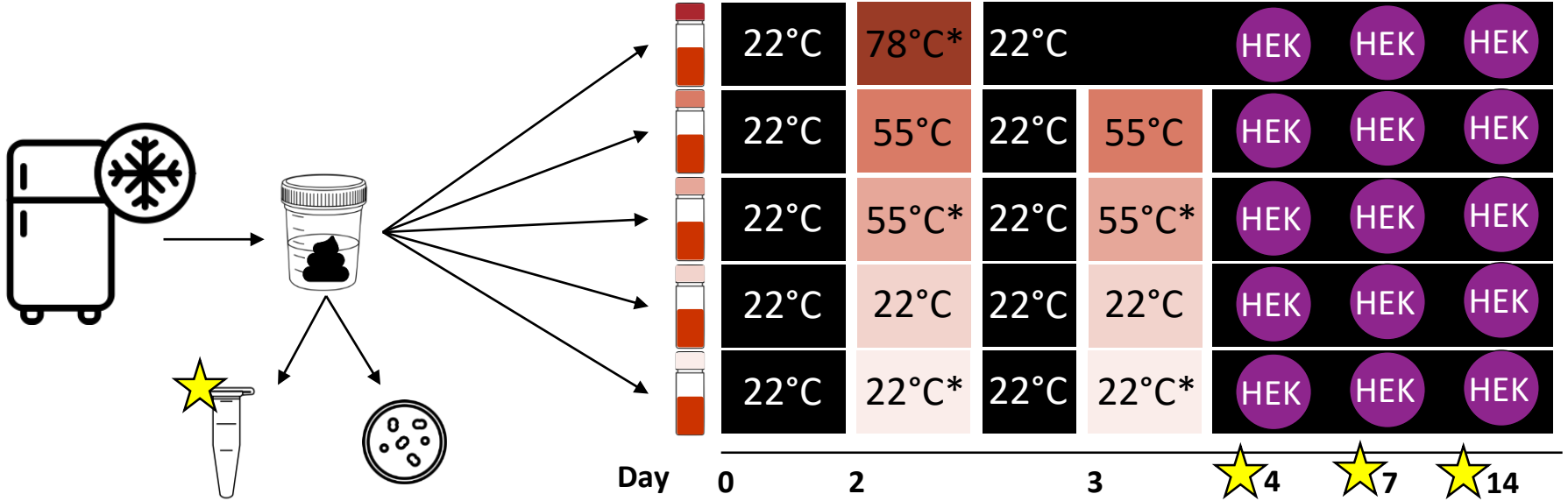
7
days

14
days



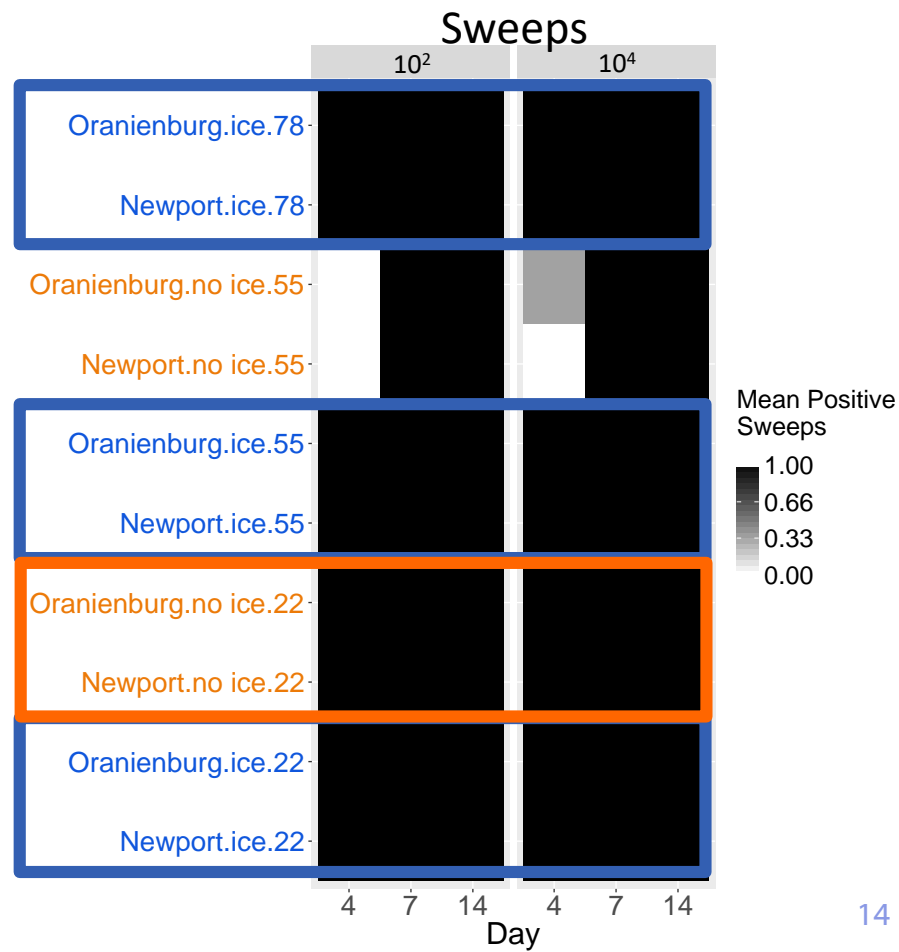
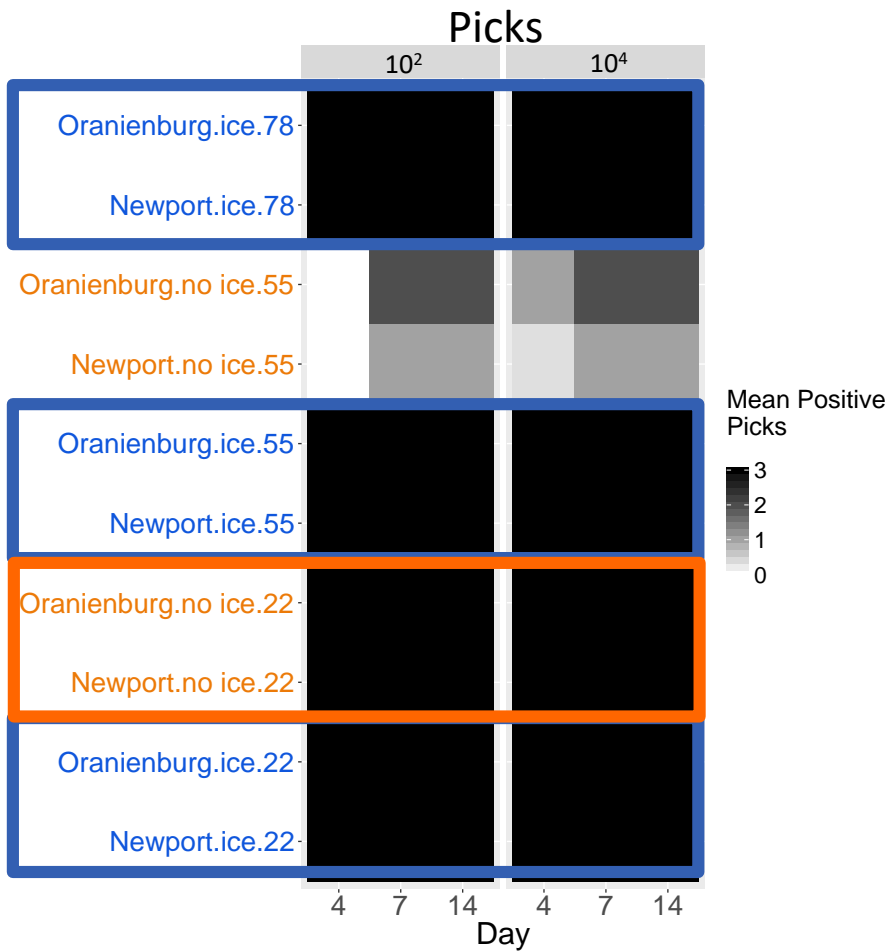
Hektoen

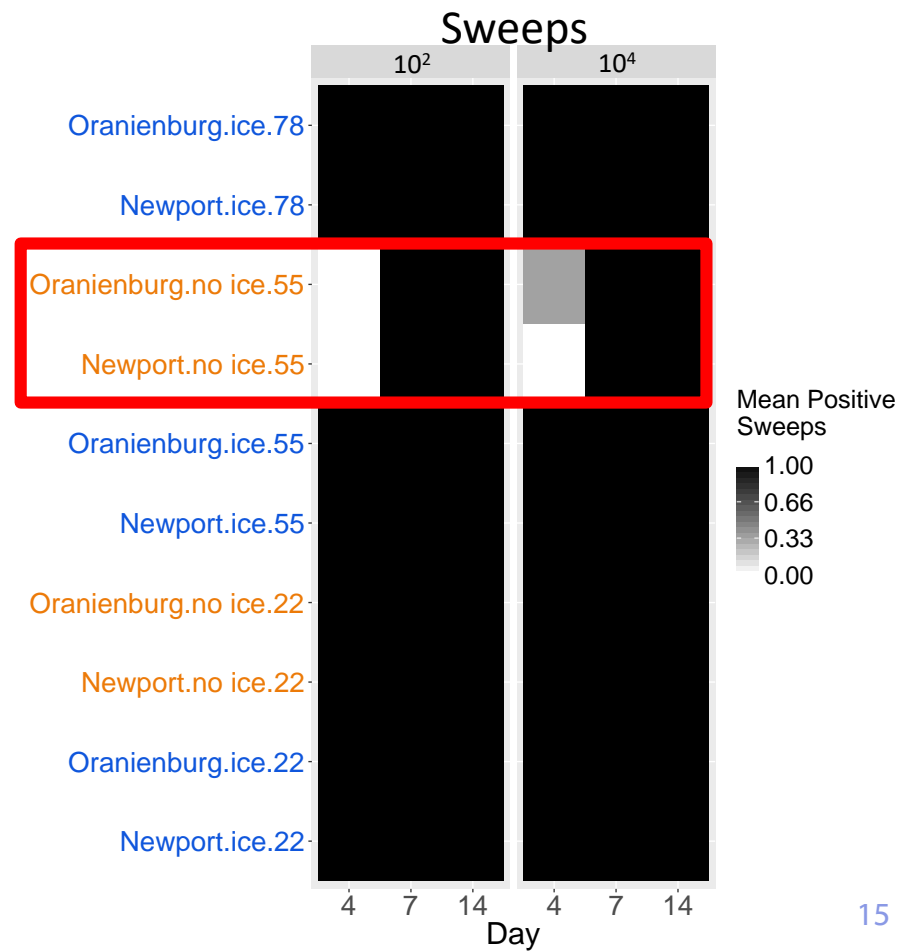
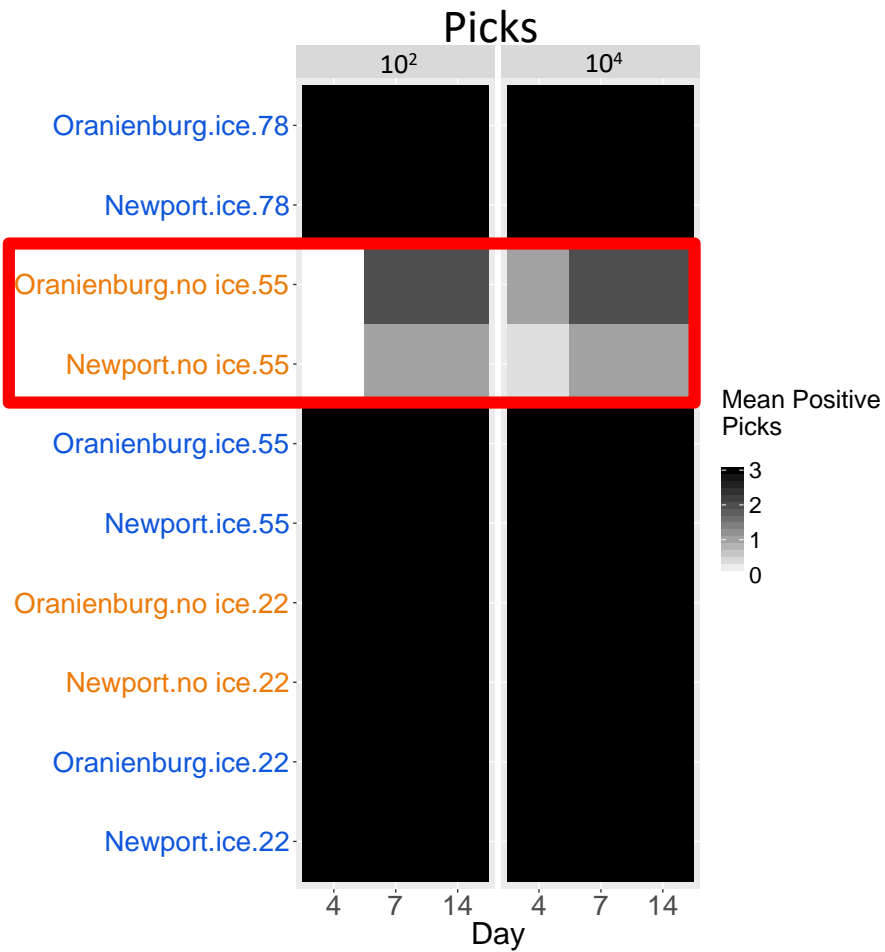
Phase 1.1: Workflow



<u>Seeded:</u> 3 colony picks 1 sweep	<u>Unseeded:</u> 6 colony picks 1 sweep
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*ice mitigation





Outcomes

- No difference in recovery between specimens on ice vs 22°C
 - For Phase 2, hold samples at 22°C
- We recommend that during warmer months...



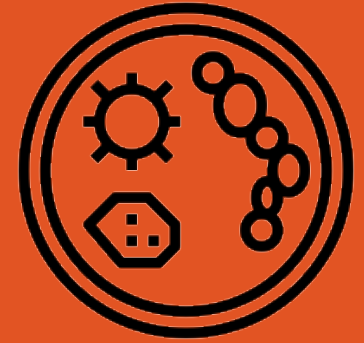
Clinical Lab

22°C



SPHL Lab

22°C



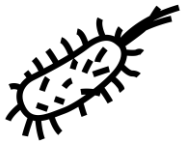
Phase 2

Is an enrichment necessary for recovery? If so, how well does it improve *Salmonella* growth and suppress commensal growth?

Oranienburg



Newport



Unspiked



22°C

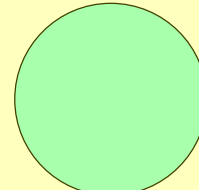
10^3 10^2 10^1 US



Cary-Blair



Hektoen



MSRV



TET
37



TET
42

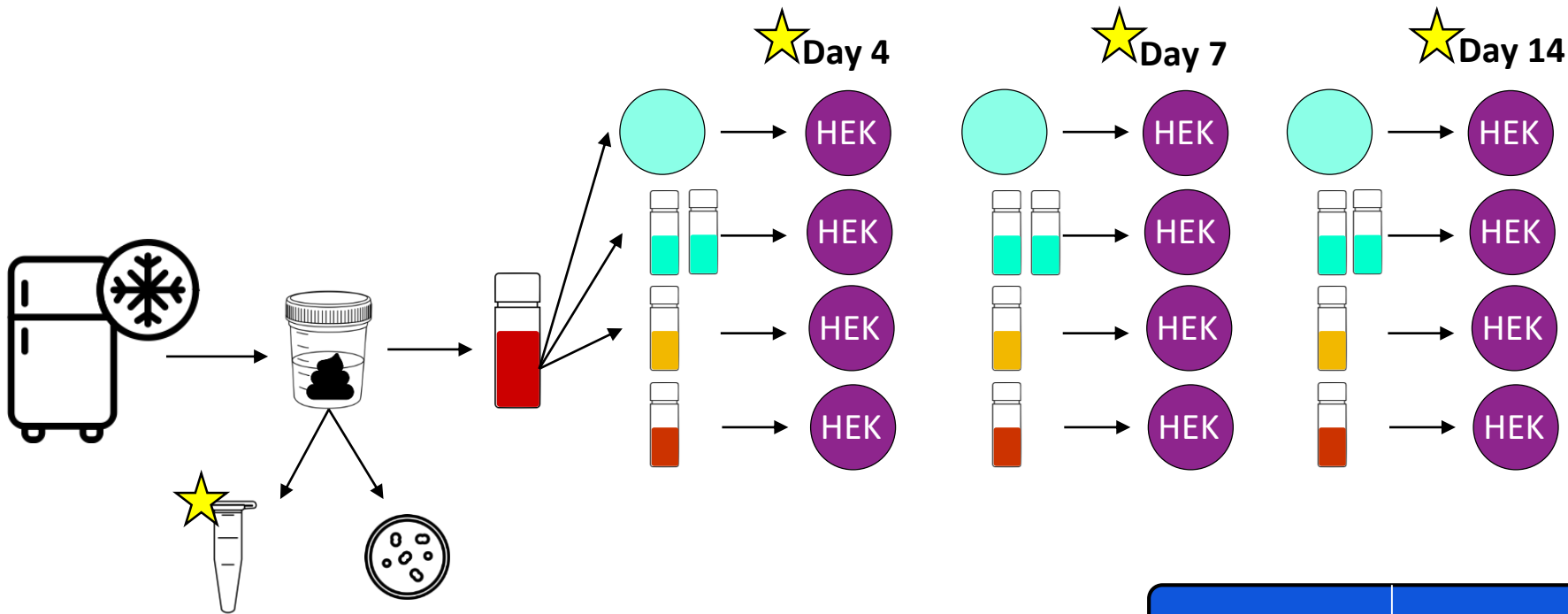


SEL

4
days

7
days

14
days



<u>Seeded:</u> 3 colony picks 1 sweep	<u>Unseeded:</u> 6 colony picks 1 sweep
---	---

100% Recovery!!

So far...

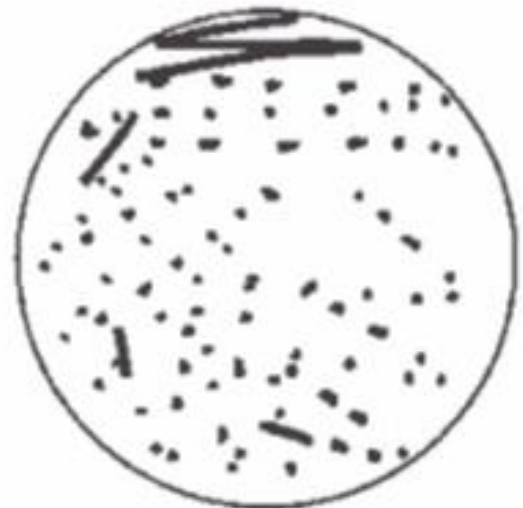
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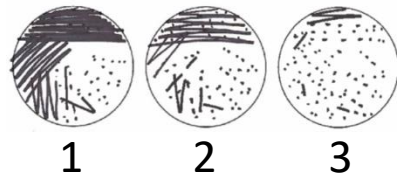


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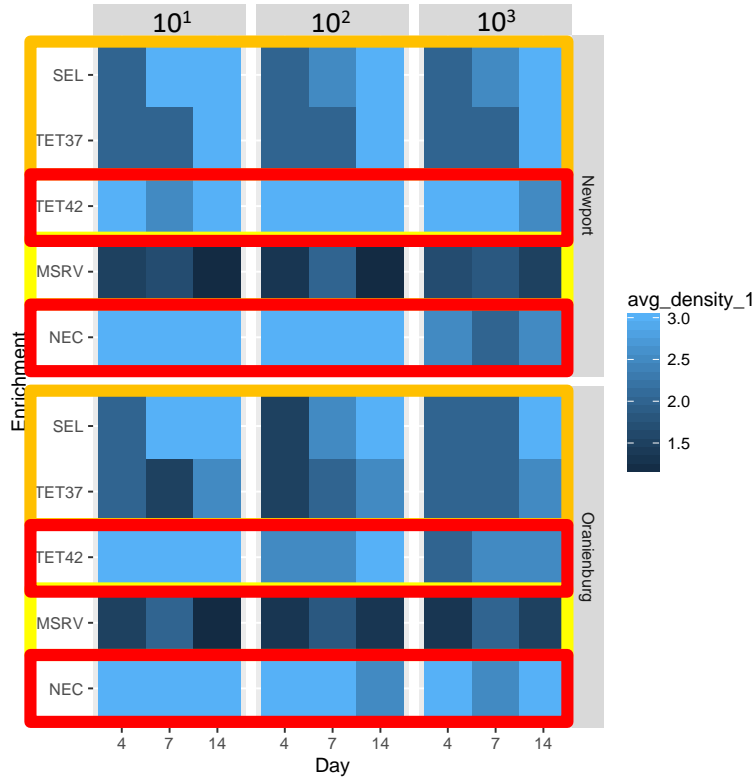


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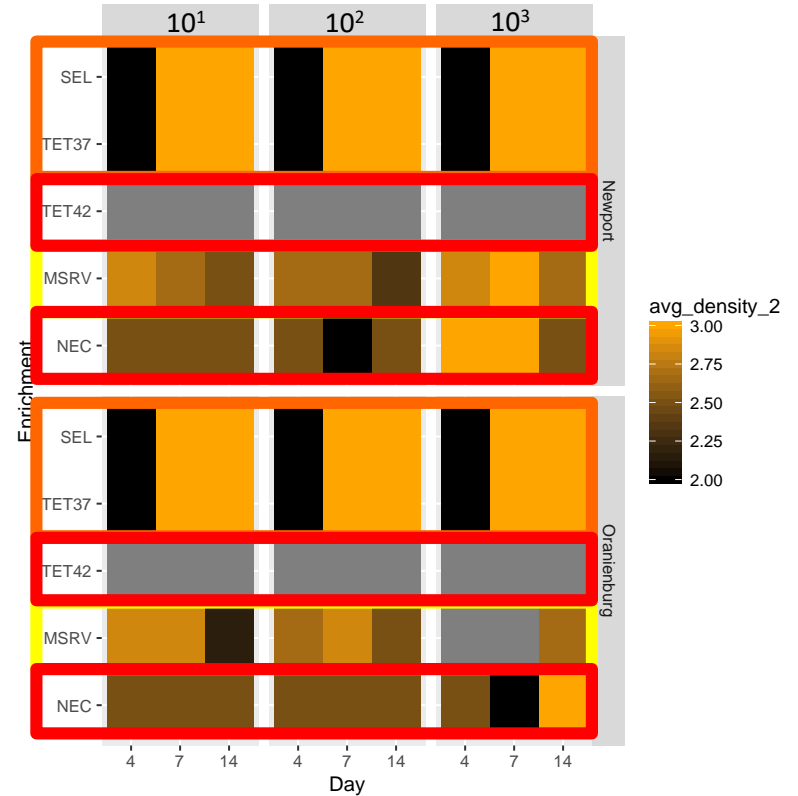




Salmonella Density



Commensal Density



Pros	Enrichments	Cons
<ul style="list-style-type: none"> • Plate immediately • User-friendly, no preparation required • Long shelf-life 	Cary-Blair - Control	<ul style="list-style-type: none"> • <100% recovery on low inoculum samples • Potentially a lot of commensal growth
<ul style="list-style-type: none"> • Easy to make • 1-day incubation • Eliminates some commensals • 100% recovery • User-friendly, easy prep • Long shelf-life 	Selenite	<ul style="list-style-type: none"> • Hazardous • Has to be carefully disposed of • Not a lot of <i>Salmonella</i> growth
<ul style="list-style-type: none"> • 1-day incubation • Eliminates some commensals • 100% recovery • Long shelf-life 	Tetrathionate (37°C)	<ul style="list-style-type: none"> • Somewhat difficult to make • Has to be carefully disposed of • Not a lot of growth
<ul style="list-style-type: none"> • Eliminates most commensals • 100% recovery • Long shelf-life 	Tetrathionate (42°C)	<ul style="list-style-type: none"> • 2-day incubation • Very poor growth • Has to be carefully disposed of
<ul style="list-style-type: none"> • Eliminates some commensals • 100% recovery • A lot of <i>Salmonella</i> growth 	MSRV Semisolid Plates	<ul style="list-style-type: none"> • Short shelf-life • Time consuming and difficult to make • Has to be carefully disposed of

Preliminary Outcomes

- 100% recovery across all enrichments
- Deciding on an enrichment:
 - Cost
 - Preparation difficulty/time
 - Commensal suppression
 - Shelf-life



Next Steps

Next Steps

- Write up our recommendations
- Meet with APHL Subcommittee
- Pilot testing with SPHLs (Spring/Summer 2019)
 - 4-5 labs
 - Concurrent workflows
- Begin STEC Isolate Recovery Project

Acknowledgments

- Jo Williams-Newkirk
- Andrew Huang
- Heather Carleton
- Yang Gao
- Jasmine Hensley
- Brooke Aspinwall
- Nancy Garrett
- Susan Van Duyne

TheNounProject Acknowledgments

- StoneHub, NZ
- BomSymbols, TH
- SBTS, IN
- Mynamepong, TH
- Faisalovers, ID
- Claire Jones, GB
- Creaticca Creative Agency, GB
- Edwin Prayogi M, ID
- Jenna Rabideaux
- Anna Bearne, GB
- Orin zuu
- Javi Ayala, ES
- Humantech, ID
- Jae Deasigner
- Template, TH
- Eugen Belyakoff, RU
- Hendra sudibyo
- CombineDesign
- Egon Låstad, NO
- Gan Khoon Lay
- AomAm, TH
- David, US
- Milinda Courey
- Dara Ullrich, DE
- Vectors Market
- Lee Mette, DE
- Eucalyp
- Juraj Sedlák, SK
- Wireform, US
- Strokeicon
- Wilson Joseph
- Brand Mania

Thank you!

For more information, contact CDC
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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

