Application of Whole Genome Sequencing to Antibiotic Resistance Surveillance and Outbreak Investigations

Kelsey Florek, MPH, PhD
2019 APHL Annual Meeting
June 04, 2019

Slides available at:
www.k-florek.net/talks
10 cls
20 DIM weight as DOUBLE
30 INPUT "Enter your weight", weight
40 DIM moon as DOUBLE
50 moon = weight / 9.81 * 1.622
60 PRINT "Your weight on the moon is ", moon
Lab Capacity Supported by the AR Solutions Initiative: Regional Labs

Healthcare Labs | State/Local Labs | Regional Labs | CDC

- **WEST**
  - Washington State Public Health Laboratories
    - Core Testing
    - C. difficile
    - N. gonorrhoeae

- **CENTRAL**
  - Minnesota Department of Health Public Health Laboratory
    - Core Testing
    - C. difficile
    - Bacterial Culture pilot
    - S. pneumoniae

- **MOUNTAIN**
  - Texas Department of State Health Services Laboratory
    - Core Testing
    - N. gonorrhoeae

- **MIDWEST**
  - Wisconsin State Laboratory of Hygiene
    - Core Testing
    - Bacterial Culture pilot
    - S. pneumoniae

- **NORTHEAST**
  - Wadsworth Center Bacteriology Laboratory
    - Core Testing
    - C. difficile

- **MID-ATLANTIC**
  - Maryland Public Health Laboratory
    - Core Testing
    - N. gonorrhoeae

- **SOUTHEAST**
  - Tennessee State Public Health Laboratory
    - Core Testing
    - C. difficile
    - N. gonorrhoeae
    - Bacterial Culture pilot

ARLABnetwork
Bioinformatics Pipeline

BaseSpace   SEQUENCE HUB

FastQC
got to work
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Salmonella outbreak linked to peas sold at Farmers Markets

By Brittany Schmidt | Posted: Fri 1:44 PM, Aug 11, 2017 | Updated: Thu 8:23 PM, Jul 12, 2018

BROWN COUNTY, Wis. (WBay) - The Wisconsin Department of Health Services says at least seven people have fallen ill with Salmonella poisoning linked to peas sold at Farmers Markets in Green Bay, Madison, and Fond du Lac.

The fresh peas were sold July 22. They were sold as loose, shelled peas that were no longer in the pod.

Four of the illnesses are linked to peas sold at the Green Bay Saturday Farmers Market. One person was hospitalized.

Health officials continue to investigate the source of the peas. The Brown County Public Health Department is not releasing information on the vendor at this time.

Anyone who purchased loose peas from Green Bay, Fond du Lac or Madison farmers markets between July 19 and Aug. 5 is advised to throw them away.

The loose peas are no longer being sold at area farmers markets.
collaborations

- Wisconsin Department of Public Health
- Wisconsin Veterinary Diagnostic Laboratory
- ORegon CHild Absenteeism due to Respiratory Disease Study (ORCHARDS)
- Strategic planning for sequencing and bioinformatics at the State Laboratory
WHAT TO DO WHEN YOU'RE OVERWHELMED WITH WORK

STEP 1: MAKE A LIST OF ALL THE THINGS YOU HAVE TO DO.

STEP 2: CATEGORIZE THEM BASED ON THEIR IMPORTANCE.

STEP 3: REALIZE YOU JUST MADE IT WORSE.

AAH! THEY'RE ALL IMPORTANT!!

TO DO:

- Important for my thesis!
- Important for my funding!
- Important for my bills!
- Important for my career!
- Important for my professor!

WWW.PHDCOMICS.COM
Carbapenem Resistant Acinetobacter baumannii outbreak
Antimicrobial susceptibility

- Amikacin: Resistat
- Aztreonam: Resistat
- Cefepime: Resistat
- Cefotaxime: Resistat
- Ceftazidime: Resistat
- Ciprofloxacin: Resistat
- Colistin: Susceptible
- Doripenem: Resistat
- Imipenem: Resistat
- Levofloxacin: Resistat
- Meropenem: Resistat
- Minocycline: Intermediate
- Piperacillin-tazobactam: Resistat
- Polymyxin-B: Susceptible
- Ticarcillin-clavulanate: Resistat
- Tobramycin: Resistat
Carbapenem-resistant Acinetobacter baumannii Harboring a Plasmid Carrying blaOXA-72 in an Outbreak Involving an Intensive Care Unit and Long-term Care Facilities in Wisconsin
Conclusions

- Chance favors the prepared mind. - Louis Pasteur
- Expand laboratory capacity
- Work in an area I love
Acknowledgements

- Wisconsin State Laboratory of Hygiene
  - David Warshauer
  - Peter Shult
  - Allen Bateman
  - Alana Sterkel
  - Sara Wagner
- Wisconsin Department of Public Health
  - Megan Lasure
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  - Jordan Mason
  - Rachel Klos
- Association of Public Health Laboratories
  - Nikki Marchan
  - Kelly Wroblewski
  - Christin Hanigan

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