Our Approach

Interagency collaboration which:

- Builds on a history of collaborative programs
  - Interagency Food Safety Analytics Collaboration (IFSAC)

- Applies advances in technologies

- Leverages knowledge, expertise and data among agencies

- Builds an efficient structure guided by strategy

- Prioritizes communications and stakeholder input

Interagency Collaboration on Genomics for Food and Feed Safety (Gen-FS)

- Formed in 2015 to strengthen federal collaboration on use of WGS in foodborne pathogen analysis and investigation

- Multiple Federal Agencies participating
  - Food and Drug Administration (FDA)
  - Centers for Disease Control and Prevention (CDC)
  - National Institutes of Health (NIH)
  - Food Safety and Inspection Service (FSIS)
  - Agricultural Research Service (ARS)
  - Animal and Plant Health Inspection Service (APHIS)

Gen-FS

- **Supports implementation of a shared vision of coordinated networks for genomic sequencing**
  - Flexible to encompass multiple tools, analyses, and communications needed by the respective agencies
  - Harmonizes procedures and standards
  - PulseNet
  - GenomeTrakr

Gen-FS

Targets for development, coordination, and harmonization:

System tools, data pipelines, and methods	Analytic procedures, protocols, and standards	Data sharing and availability
Harmonized proficiency testing and training	Use in surveillance, investigation and research	External communication and partnerships

Gen-FS Governance

- **Draft Charter**
- **Steering Committee- representation from each agency**
- **Workgroups**
    - Data Standards, Analytics, Comparisons and Interpretation
    - Interagency Training
    - GenomeTrakr-PulseNet workflow harmonization
    - Communications

Gen-FS Priority:
Build a Shared Structure and Strategy

- **DNA sequence and metadata publically available**
 - Data uploaded to NIH/National Center for Biotechnology Information public database (GenBank)
  - All organisms undergoing WGS in PulseNet and GenomeTrakr
  - Clinical, food, environment
  - Identity protected (commercial, personal)

- **Tools and methods publically available**
  - Open source or commercially available software
  - Publication of methods and validation analyses

Gen-FS Workgroup Activities: Standards and Validation

- **Qulality standards monitored for all submissions**
- **Develop and publish benchmark datasets**
- **SNP and wgMLST validation studies**
  - Individual pipeline and cross validation
- **AMR genotype/phenotype comparison**
  - Publication pending
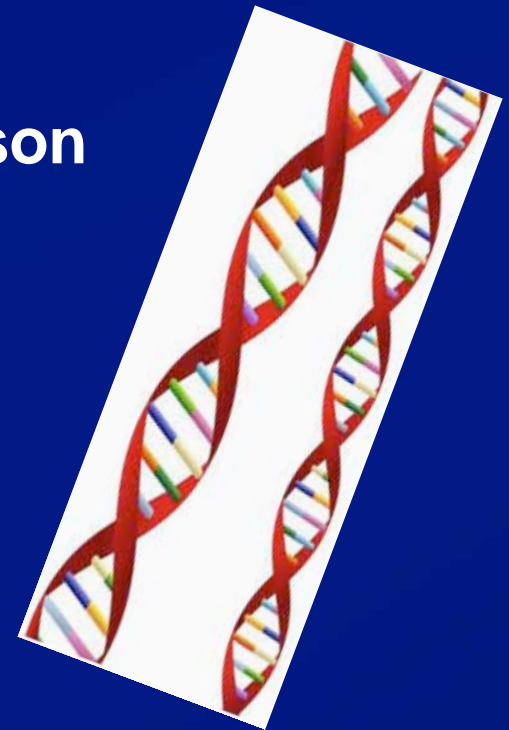
Benchmark Datasets

- **5 DNA sequence datasets consisting of 10 to 31 well characterized outbreak and unrelated isolates**
  - *Listeria monocytogenes*
  - *Campylobacter jejuni*
  - *E. coli*
  - *Salmonella*

- **Associated outbreak details published**

- **Datasets available for download**
  - https://github.com/WGS-standards-and-analysis/datasets

Gen-FS Workgroup Activities: Harmonization Across Networks

- **Training**
  - Training provided for public health and regulatory program partners in PulseNet and GenomeTrakr networks
  - CDC and FDA sponsored courses
  - Staff from each agency participate as training faculty
  - Training certification applicable to both networks
- **Laboratory SOPs for WGS**
  - Sample and DNA library preparation
  - Sequencing procedure
  - Data management and upload to NCBI
  - Incorporate new and changing technologies
- **Proficiency testing**
  - Standard panel, analysis and reporting

Gen-FS Workgroup Activities: Communications

- **Industry collaborative forums**
  - Institute for Food Safety and Health
  - University of Georgia Center for Food Safety
- **Food safety and scientific conferences**
  - International Association for Food Protection
  - Food Safety Summit
  - American Society for Microbiology
  - Global Microbial Identifier
- **White paper publication (drafting stage)**
  - Use of WGS in food safety
  - Peer reviewed journal

Looking to the Future

q **WGS to replace traditional methods for routine microbiologic characterization of foodborne pathogens**

   § Surveillance

   § Investigation

   § Action

q **Validated and comparable results**

Looking to the Future

- **Shared tools, standards and data for all stakeholders**
    - Public health
    - Regulatory
    - Industry
    - Academic
    - International

- **Simplified WGS analyses**
    - No requirement for high performance computing and advanced bioinformatics expertice

Thank You!

Gen-FS members

Communications Workgroup

USDA-FSIS for hosting this meeting

Your interest and input