

## **Stakeholder comments**

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## *Whole Genome Sequencing (WGS)*

Identifying, tracking and mitigating pathogens across the food supply chain is critical to control food safety and protect public health locally, regionally, internationally

Fast, accurate and efficient methods are preferred,.....

.... as are harmonized, reliable and quantitative approaches underpinning risk-based management of food safety and suitable for the globalized food trade system

WGS is moving towards being the method of choice in outbreak investigations and root cause analysis

WGS bears the promise of further strengthening our public and private efforts for food safety assurance

# Whole Genome Sequencing (WGS)

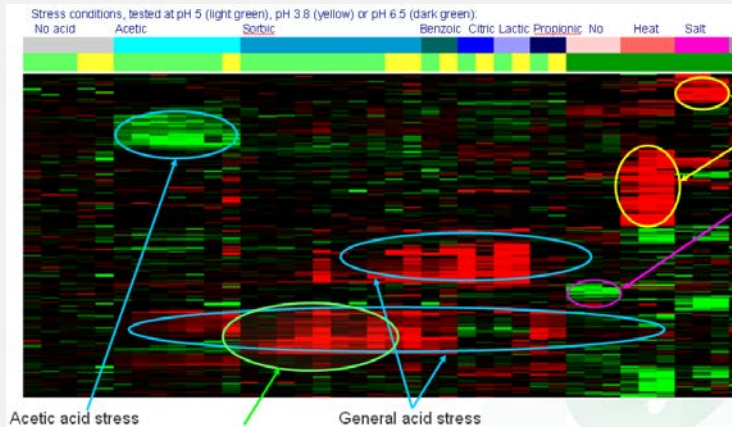
## Possible applications of WGS by Industry

### Research phase

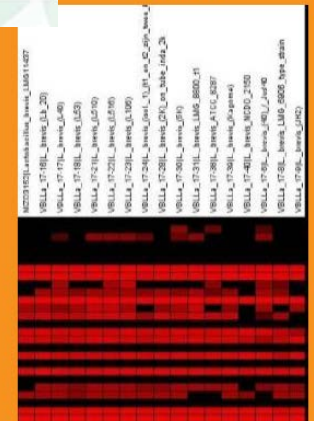
- Understanding properties of micro-organisms (e.g. preservation targets; resistance traits)
- Innovating food preservation systems
- Validating safe product and process designs (e.g. challenge testing context)

### Operational setting

- Investigating microorganisms in business operations (e.g. tracing microbes; root cause analysis of contamination events; supply chain integrity)



*L. brevis*

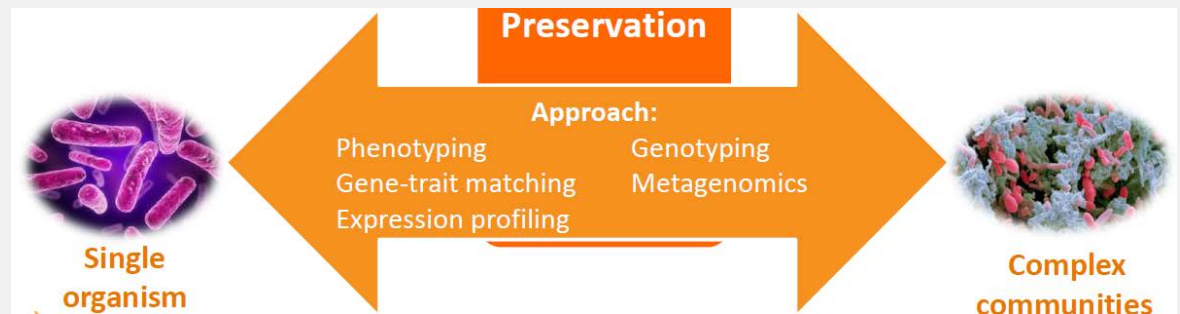
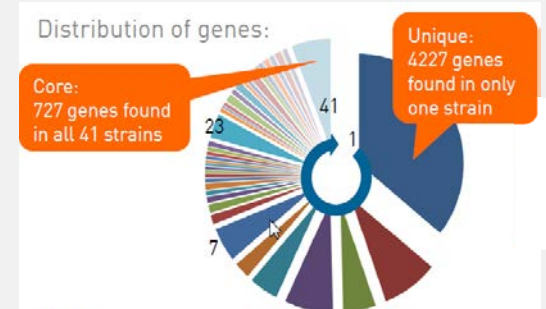


# Whole Genome Sequencing (WGS)

## Benefits and investments for using WGS by Industry

### WGS benefits

- More accurate, higher “resolution” than PGFE
- Important part of the suite of available molecular biology tools
- Unravelling complex communities



### Investment needed

- In WGS skills and capabilities (and capacity)
- In tools/expertise
- In equipment

DIY and / or outsource?

## *Whole Genome Sequencing (WGS)*

However (questions for general discussion),.....

Are scientific studies available to validate the correct interpretation of finding particular genetic profiles in homes, environments or business operations?

Is the technology mature enough for us to understand the relationship between genotypic traits of isolates and actual risk to public health, rather than potential hazard presence in food or food ingredients/environments?

Is it a tool/capability able to be deployed consistently globally in terms of skills and capabilities required (e.g. challenges of Big Data analysis & bioinformatics)?

Are the data sharing systems and their governance geared up to their Big Data task at local, regional and global level?

Is there clarity on the regulatory response when “interesting” or “suspect” WGS profiles are found

## *Whole Genome Sequencing (WGS)*

Technical questions for discussion

How many SNPs differences (2-5?) is the criterion for a definite match between two WGS patterns? Is this the same for various pathogens?

When the number of SNPs difference is for instance 2 or 5 for two strains, it could be different nucleotides for which they differ in their individual profiles. Is validation needed that these different nucleotides impact on the pathogen posing a health hazard?

Is the SNPs profile of an isolate stable over time? Is this the same for various pathogens?

What influences the SNPs profile of an isolate and could it be that unrelated isolates by chance match in terms of the number of SNPs difference?