

# Stakeholder perspective on genomic data sharing: Industry's point of view (by proxy)

6 September 2023 João André Carriço

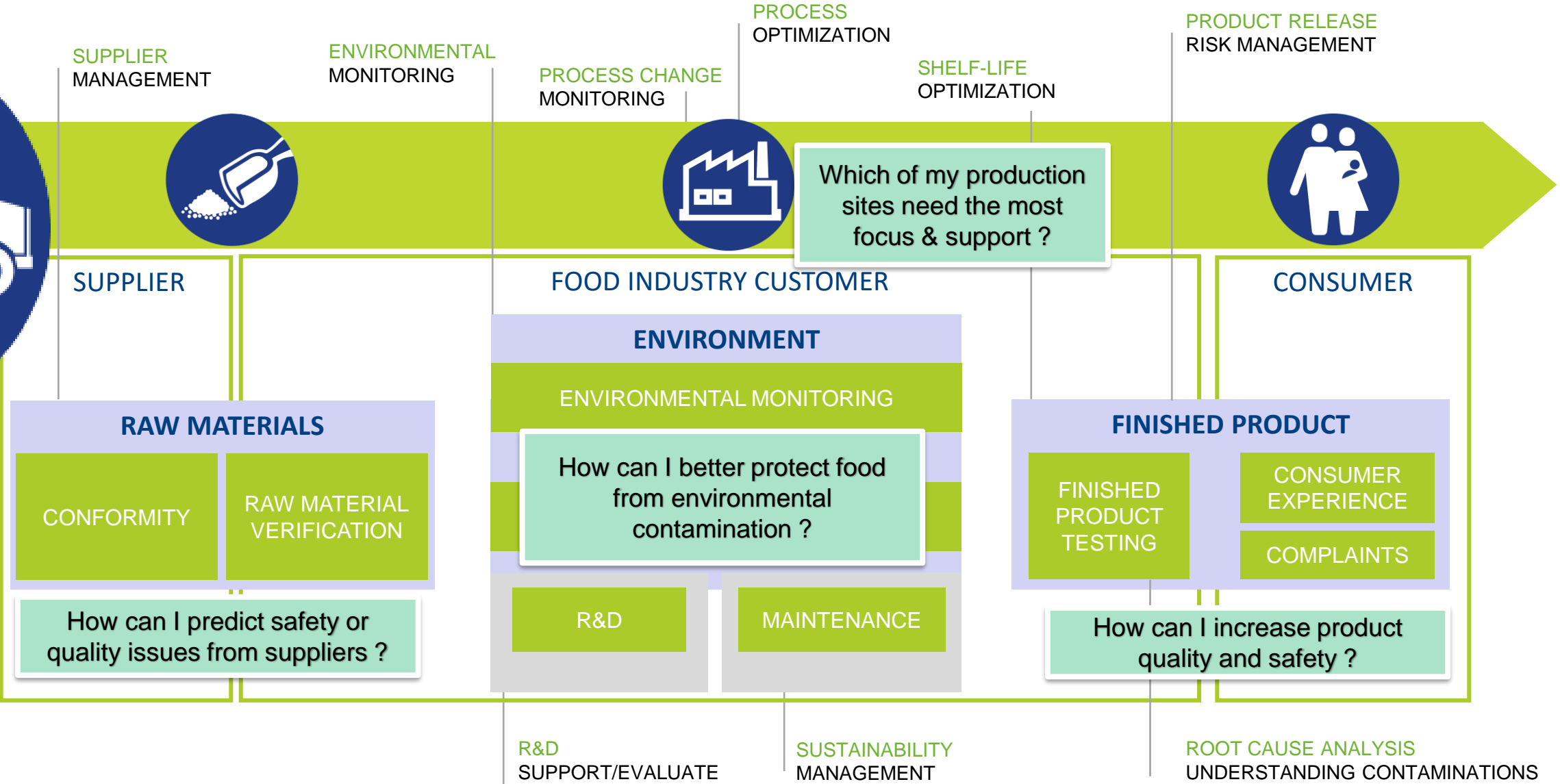
# AGENDA

- Genomics for Food Safety and Food Quality
- Current Challenges for Genomics in Food Industry
- Models for Data Sharing
- Conclusions

# GENOMICS FOR FOOD SAFETY AND FOOD QUALITY



# BIGGER QUESTIONS THAT CUSTOMERS ARE ASKING US



# “BIGGER” QUESTIONS THAT CUSTOMERS ARE ASKING US



How can I use my microbiology testing to Predict and Prevent, rather than just try to React?

SEQUENCING QUESTIONS



SUPPLIER

FOOD INDUSTRY CUSTOMER

CONSUMER

RAW MATERIALS

CONFORMITY

RAW MATERIAL VERIFICATION

How can I better assess pathogen risks in my supply chain?

How do pathogens migrate geographically? What are my emerging risks?

ENVIRONMENT

How can I reduce the risk of environmental contamination?

PRODUCTION PROCESS

R&D

MAINTENANCE DATA

Do the pathogens have any known resistance to biocides, temperature, pH?

How do I address the gap between presence/absence testing and genomic epidemiology?

FINISHED PRODUCT

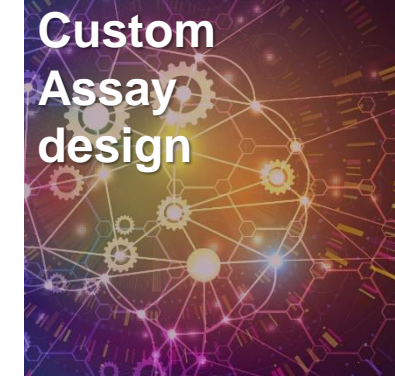
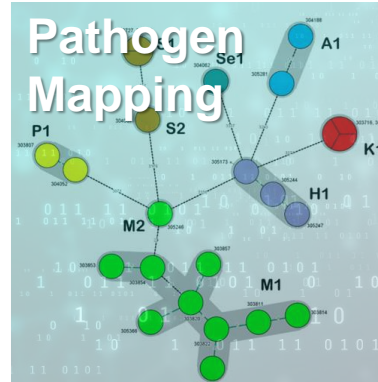
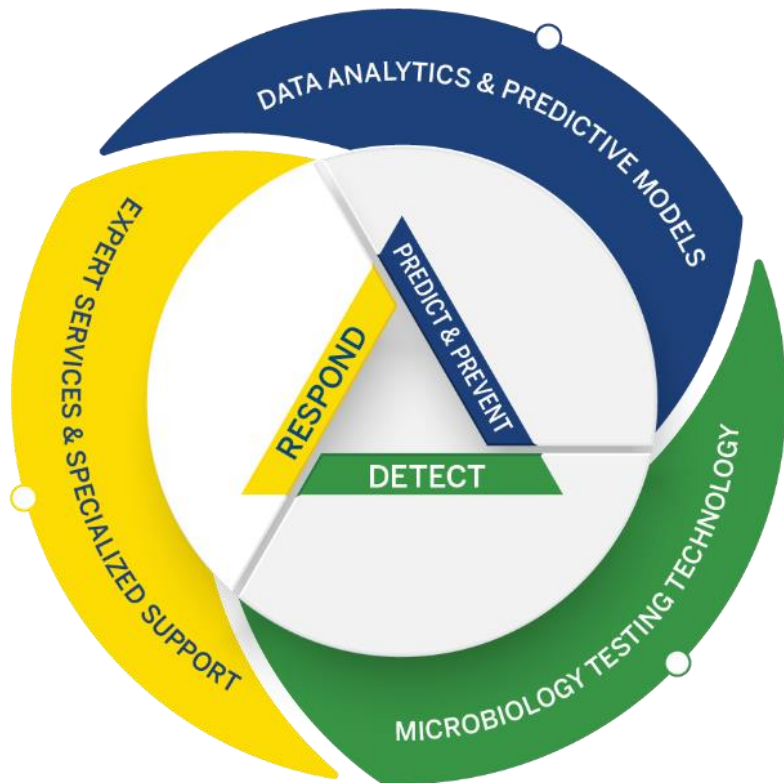
FINISHED PRODUCT TESTING

CONSUMER EXPERIENCE

COMPLAINTS

How can I reduce spoilage and increase shelf life?

# BIOMERIEUX GENOMICS OFFER



## SEQUENCING & BIOINFORMATICS APPLICATIONS

PATHOGEN MAPPING

Relationship. Transmission. Resistance.

MICROBIOME ANALYSIS

Facility Health. Quality Management. Risk Mitigation.

## CONSULTATIVE SERVICES & SOLUTIONS

DIGITAL READINESS

Data Connectivity. Database Development. Reporting Models.

LABORATORY CONSULTANCY

Workflow Optimization. Performance Solutions. Training & Education.

# BIOMERIEUX'S ROLE



# CURRENT CHALLENGES FOR GENOMICS IN FOOD INDUSTRY





# TO SHARE DATA WE NEED TO HAVE DATA...



# THE THREE CHALLENGES FOR GENOMIC EPIDEMIOLOGY IN FOOD INDUSTRY

- Very high cost per sample:
  - ~500-1000 Euro
- Costly and difficult to maintain trained personal in sequencing wet lab and bioinformatics analysis
- Very long time to result (2-3 weeks)

Cost and time  
to results



- Low number of samples analyzed usually just show a piece of the puzzle
- Need for good quality and quantity of data to provide a better and more correct picture of reality

Still Limited  
visibility



- Currently legal landscape and agencies mode of action cause fear of litigation
- Due to the complexity of the food chain and interactions with multiple companies for several food items can lead to reputational loss if some companies are incorrectly accused

Fear of  
litigation



# SOURCE ATTRIBUTION : FOOD CHAIN COMPLEXITY



## **“The Well Traveled Salad”:**

A single Salad can contain ingredients from more than 10 countries!

# MODELS FOR DATA SHARING



# MODELS FOR GENOMIC DATA SHARING

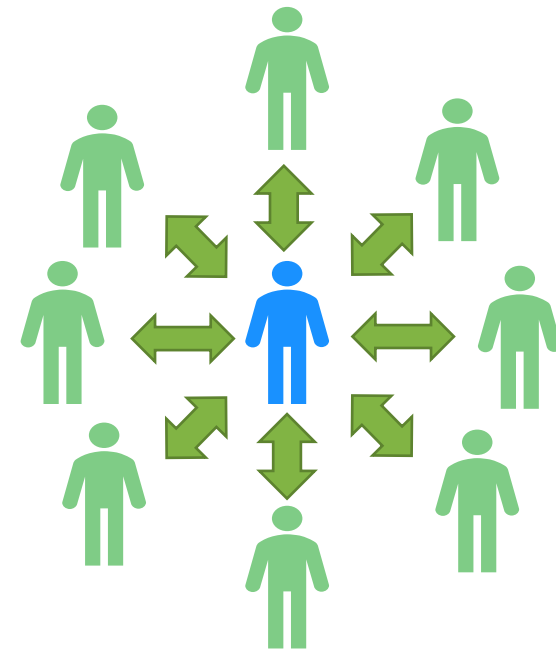
## Challenges for Data Sharing:

- ***Fear of misuse/Lack of Trust:***
  - Data quality
  - Data usage: who can see the data and when to share/not to share
- ***Liability and Legal implications:***
  - Importance of the *time* dimension
- ***Brand damage***
  - open data sharing can cause considerable brand damage if a company is wrongly accused
- ***Definition of standards***
  - what to share and how to analyze

Need for **Alignment of Incentives** for all involved parties

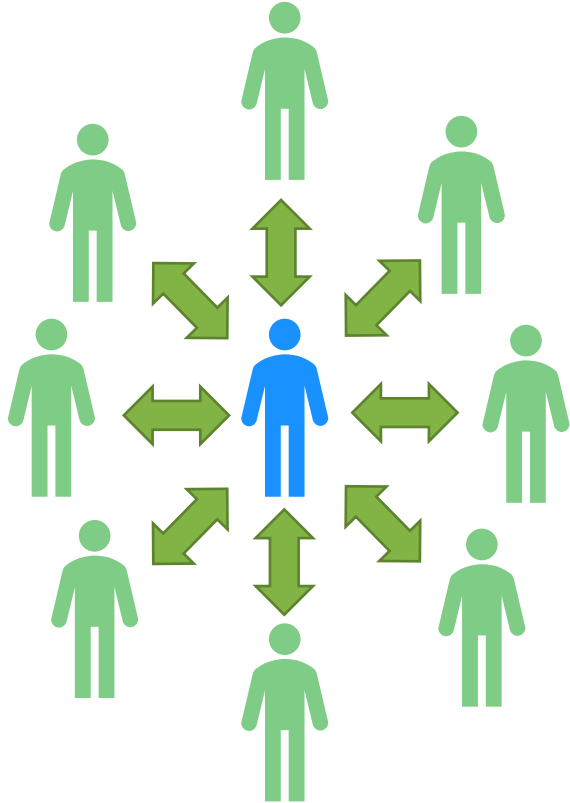
## A proposed solution:

### Trusted Third-Party Model



# MODELS FOR GENOMIC DATA SHARING

## Trusted Third-Party Model

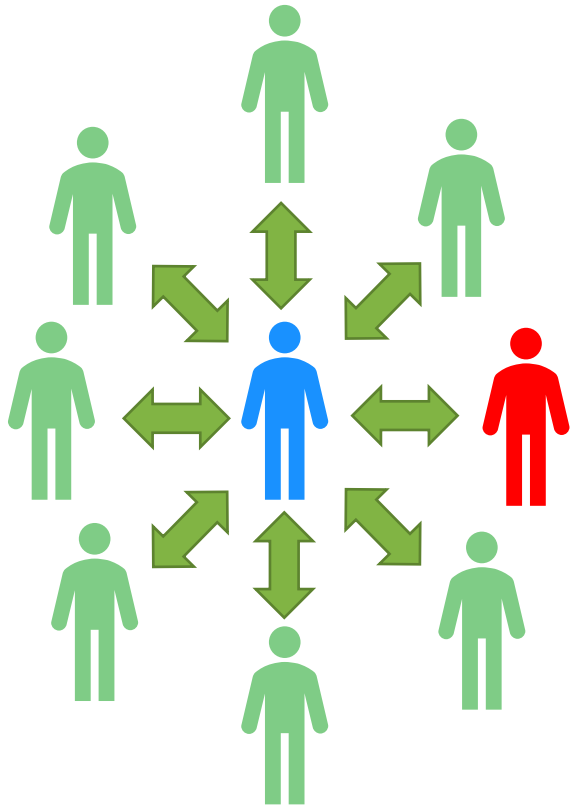


## Advantages of Trusted third-party models

- Use of standardized data formats and data analysis methods for all participants
- Centralization of data allows for a bigger picture:
  - Better tracing of pathogens across food chain using each stakeholder limited resources
  - Stakeholders can resolve the problems internally identifying root cause analysis or pathogen migration between different stakeholders
- Ease of use: common use of data analysis pipelines which reduces one of the main barriers for this field
- Your data is only visible to you. Non-identifiable data reports can be provided to the whole group

# MODELS FOR GENOMIC DATA SHARING

## Trusted Third-Party Model



## Key principles needed for alignment of incentives and the creation of data standards:

- **Neutrality:**
  - The use of a neutral 3<sup>rd</sup> party is paramount for the process
  - What about relationship with the regulator agencies?
- **Purpose and transparency:** :
  - The purpose of the system and the benefits for all the stakeholders (added value) must be commonly defined, agreed and needs to be transparent to all members of the consortium. *Key driver for industry participation is to be clear on what is the Return On Investment.*
- **Participation:**
  - the greater the number of participants the better the insights and the results. The participation of stakeholders must be voluntary.

# CURRENT EXAMPLES



NCE Seafood  
Innovation

<https://seafoodinnovation.no>



A healthy, sustainable  
source of nutrition for a  
growing global population

<https://globalsalmoninitiative.org/en/>



Food  
Industry  
Intelligence  
Network

<https://www.fiin.co.uk/>



<https://www.wga.com/>



# CONCLUSIONS



# CONCLUSIONS



Genomics data sharing holds the promise of food safety on a more integrated and potentially global scale



But first, there are currently several challenges to be overcome for a more wide-spread use of genomic technology in the food industry.



The use of trusted third-party data sharing models can provide a path to overcome current limitations and pave the way for the future.



PIONEERING DIAGNOSTICS