

# The European Union-funded Vivaldi project

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# Content of presentation



- The VIVALDI project
- Detection technology
- Formal validation procedures
- Applications and potential for use
- Questions?

# Structure of the VIVALDI project



**VIVALDI = Veterinary Validation of Point of Care Detection Instrument**

Call: H2020-SFS-2017-1 (Innovation Action)

Project No: 773422; Duration: 36 months (January 2018 - December 2020)

No	Country	Type of organisation	Business name	Short name
1	DK	National Reference Laboratory	Technical University of Denmark	<a href="#">DTU</a>
2	SE	National Reference Laboratory	Statens Veterinärmedicinska Anstalt	<a href="#">SVA</a>
3	FR	National Reference Laboratory	French Agency for Food, Environmental and Occupational Health & Safety	<a href="#">ANSES</a>
4	IT	University	University of Parma	<a href="#">UNIPR</a>
5	DK	Industry	DNA Diagnostic	<a href="#">DD</a>
6	IT	SME	Acel Services S.r.L.	<a href="#">ACEL</a>
7	DE	SME	Quh-Lab Lebensmittelsicherheit	<a href="#">QLAB</a>



# Aims of the VIVALDI project



## **General:**

- Bringing European research close to market and commercialization.

## **Specific:**

- Validate new equipment (the VETPOD platform) for rapid on-site detection of zoonotic pathogens (Avian influenza, Salmonella and Campylobacter) in industrial food and animal production chains.

# Technology platform (VETPOD)



VETPOD is a **portable** detection system which consists of

- An **instrument** containing sample processing, signal detection, and read-out to a touch screen or central computer, and
- Disposable polymeric **cartridges** (a Lab-on-Chip) performing the biological reactions of pathogen detection.
- The VETPOD system is **generic**, i.e. the cartridges may be loaded with reagents targeting almost any pathogen of choice.
- In the VIVALDI project the target pathogens are **Avian influenza virus**, **Salmonella** and **Campylobacter**

# Features of the VIVALDI technology platform



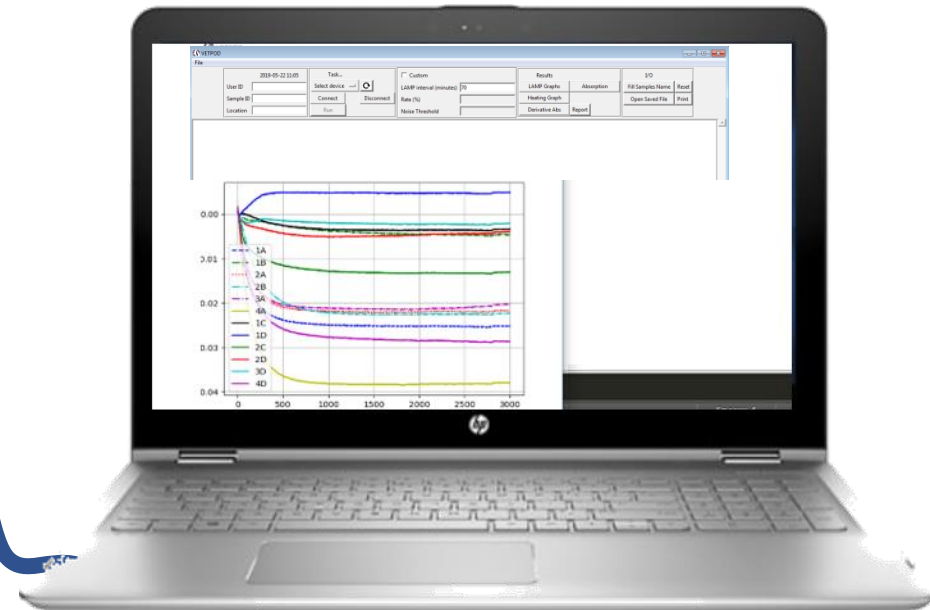
1. Stand-alone system
2. Assay: LAMP
3. Principle of detection: Turbidometry
4. Ready to use chips
5. Portable: weighing 2 kg
6. Simple operating protocols
7. Pre-loaded programs for
  - I. *Avian Influenza Virus (AIV)*
  - II. *Salmonella*
  - III. *Campylobacter*
8. Final results with conclusions

# Features ctd.

Stand-alone instrument  
(simple user feedback)



PC application connected through USB  
(advanced data handling)



# Features ctd.



Read-out:

**1. Red (blinking light):**

Positives (+)

**2. Green:**

Negative (-)

**3. Yellow:**

Retest, or verify the data



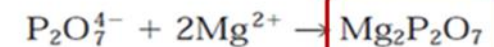
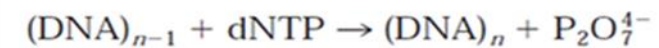
# Assay technology

- **Multiplication** of nucleic acids in sample by LAMP (Loop Mediated Isothermal Amplification)
- **Detection** of turbidity formed by precipitates during the LAMP reaction



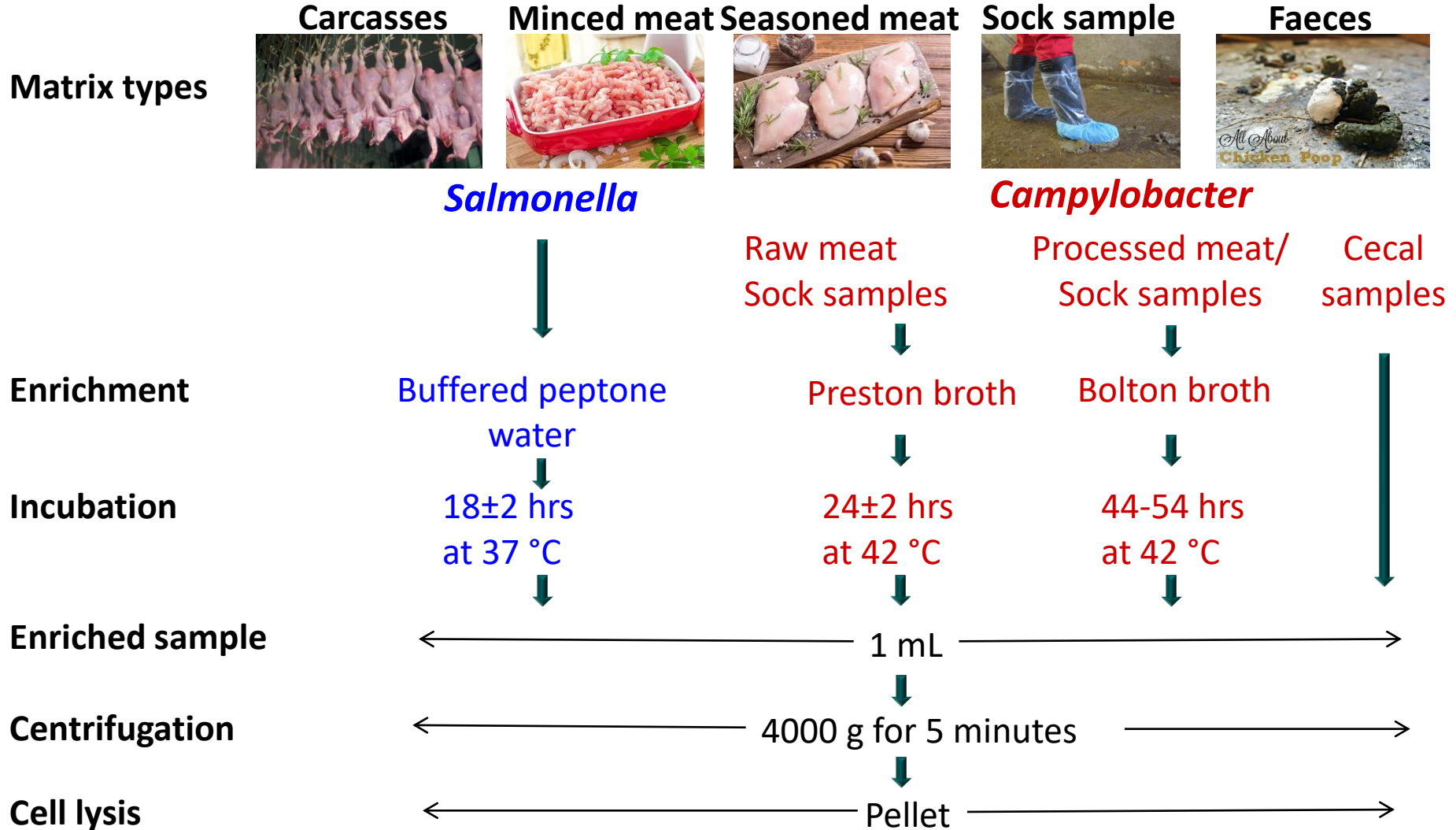
LAMP.mp4

Precipitating reaction



**Precipitate**

# Sample preparation depends on initial target concentration



# Formal validation procedures



For **Avian influenza** virus:

- Validation according to OIE requirements<sup>\*)</sup>, and respecting EU legislation<sup>\*\*)</sup>
- Matrices: 1) Oropharyngeal/tracheal swabs and 2) Cloacal swabs

For **Salmonella** and **Campylobacter**:

- Validation according to NordVal requirements against ISO 6579 (Salmonella) and ISO 10272 (Campylobacter)
- Matrix categories: 1) Raw poultry and ready-to-cook poultry products and 2) Primary production samples

<sup>\*)</sup> Chapter 1.1.6 of « Terrestrial Manual » (Principles and methods of validation of diagnostic assays for infectious diseases, May 2013)

<sup>\*\*)</sup> Commission Decision 2006/437/EC

<sup>\*\*\*)</sup> NordVal International Protocol for the validation of microbiological alternative (proprietary) methods against a reference method – Protocol No. 1, September 2018.

# Applications and potential for use



**Present project** targets the poultry production value chain (both Competent Authorities and Food Business Operators) but also e.g. the pork production chain

- Useful for screening of live animals, environmental samples and food => faster release of food or live animals with negative results
- On-site detection of samples with high initial concentrations of target (AIV, Campylobacter) => faster implementation of e.g. movement restrictions and further investigations by specialized methods

## **Advantages**

- Simple to operate, portable, robust, competitive in price, no sample transport
- Could enable small FBOs for better monitoring of food safety

# Applications ctd.



## **Potential future developments** of the platform (generic):

- Adaptation and validation for other food pathogens (e.g. Listeria)
- Adaptation and validation for subtyping of food pathogens (e.g. detection of Salmonella serotypes specified in EU legislation)
- Adaptation and validation for other animal pathogens (e.g. African Swine Fever)
- Improve sample concentration to avoid (time-consuming) enrichment steps for samples with low initial target concentrations

# Acknowledgements:

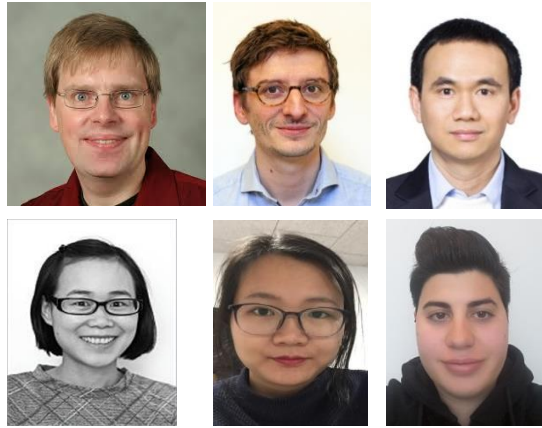


➤ European Commission  
and DTU

(H2020-SFS-2017-1 Project No: 773422)

➤ Biolabchip group, DTU-Nanotech

➤ LAMINATE group, DTU-Food



# Thank you....