Data-driven control and prioritisation of endemic contagious animal diseases

2nd Veterinary Big Data Stakeholder Forum, EMA, November 23, 2022

PROF. DR. GERDIEN VAN SCHAIK*

UTRECHT UNIVERSITY

* REPRESENTING THE DECIDE CONSORTIUM

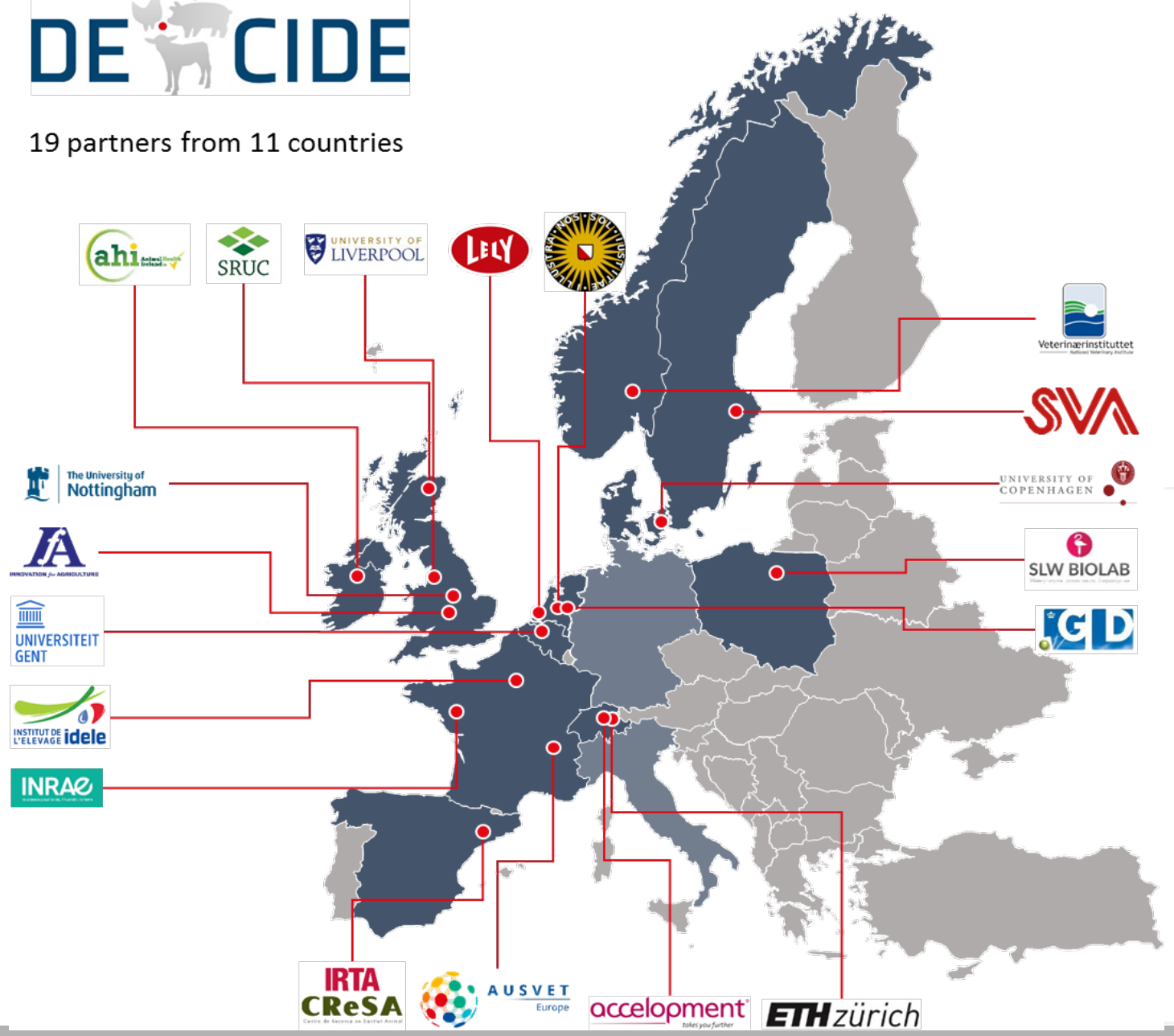
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494.

The project

- July 1th 2021
- 5 years
- ~80 people

DE CIDE

19 partners from 11 countries



Goal

Develop data-driven decision support tools and workflows that enable farmers, veterinarians and other animal health and welfare managers to improve control of prevalent endemic contagious animal diseases based on a multidimensional burden of disease metric.

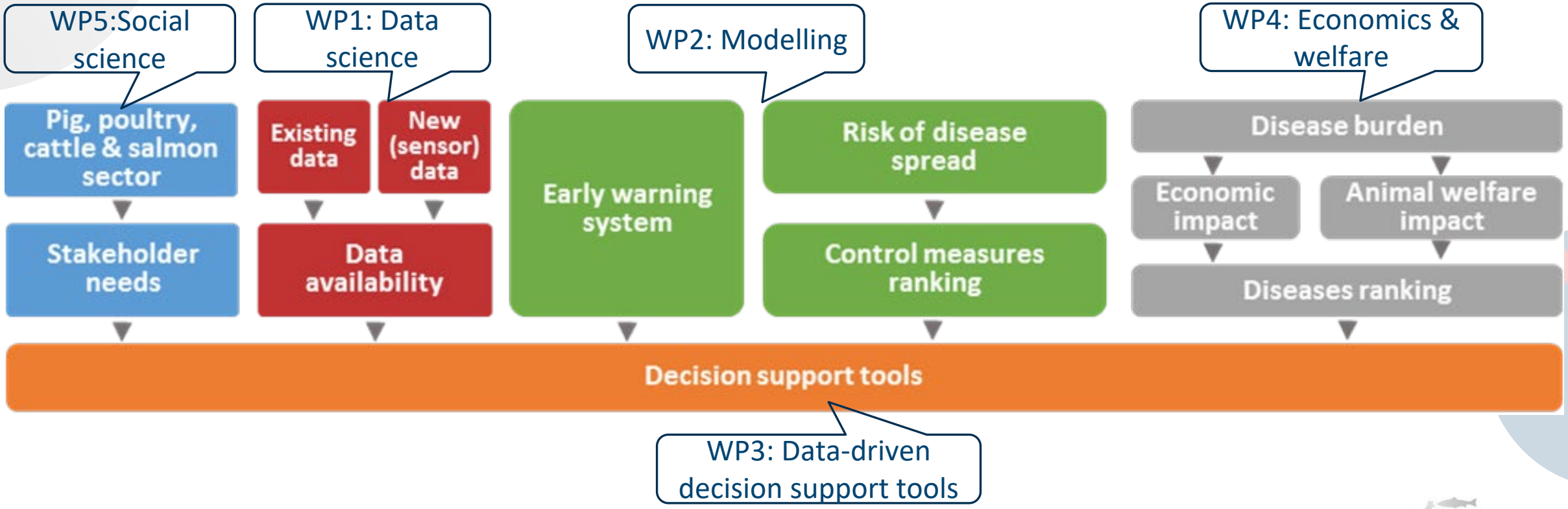



DE CIDE

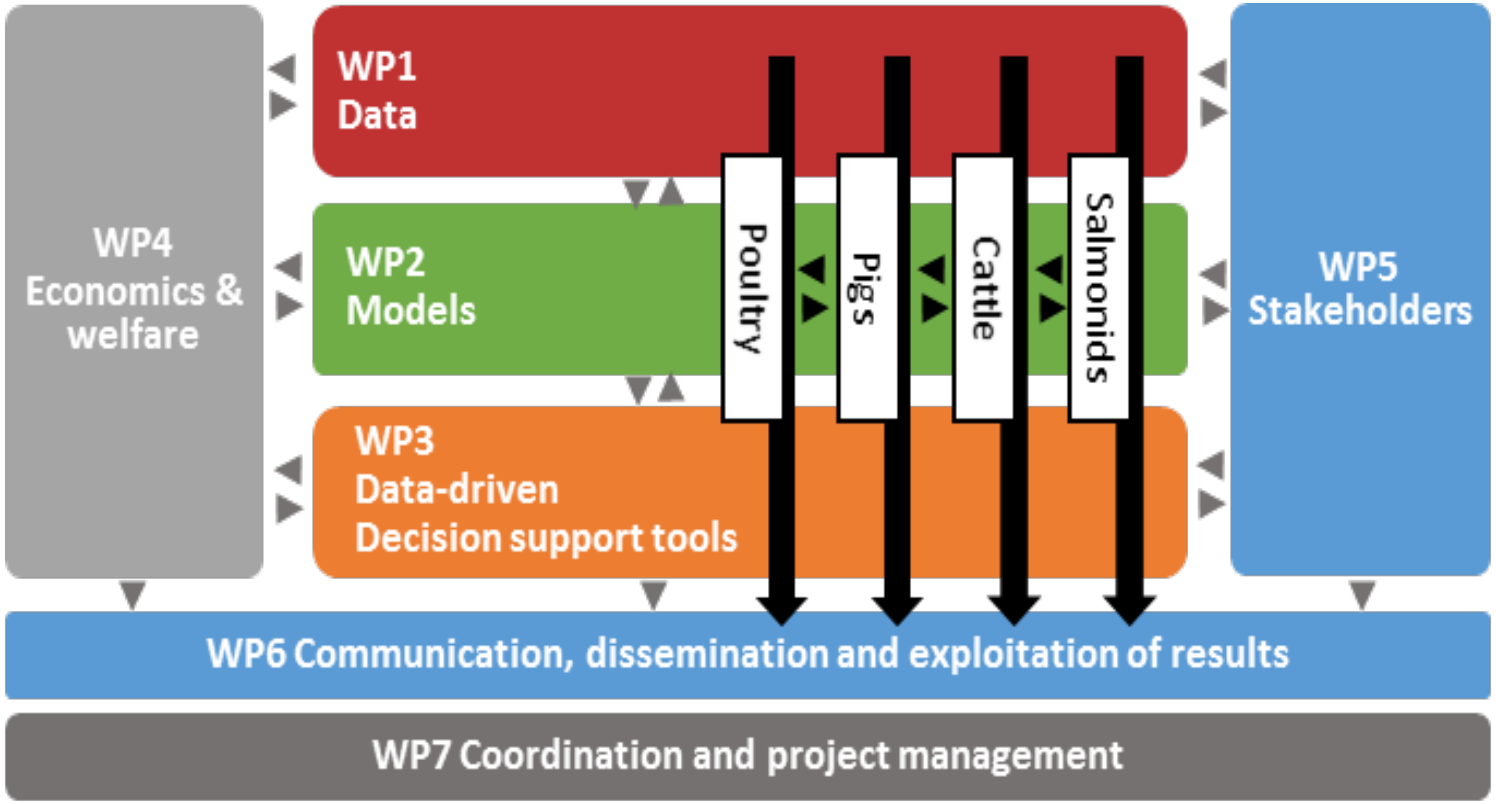
Focus

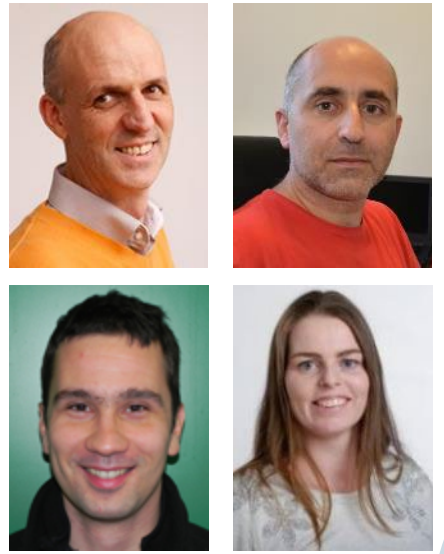
- Gastro-intestinal and respiratory tract infections of calves, pigs and poultry.
- Specific pathogens related to growth reduction and mortality in salmonids.
- Endemic diseases that
  1. may spread;
  2. have the highest impact;
  3. lead directly or indirectly to antimicrobial usage; and
  4. negatively influence the value chain.

Overall concept



Overall structure of the work plan.





Black arrows indicate the progress of the different species-specific decision-support tools through the WPs.

WP5 – Implementation and behavioural strategies for animal disease management

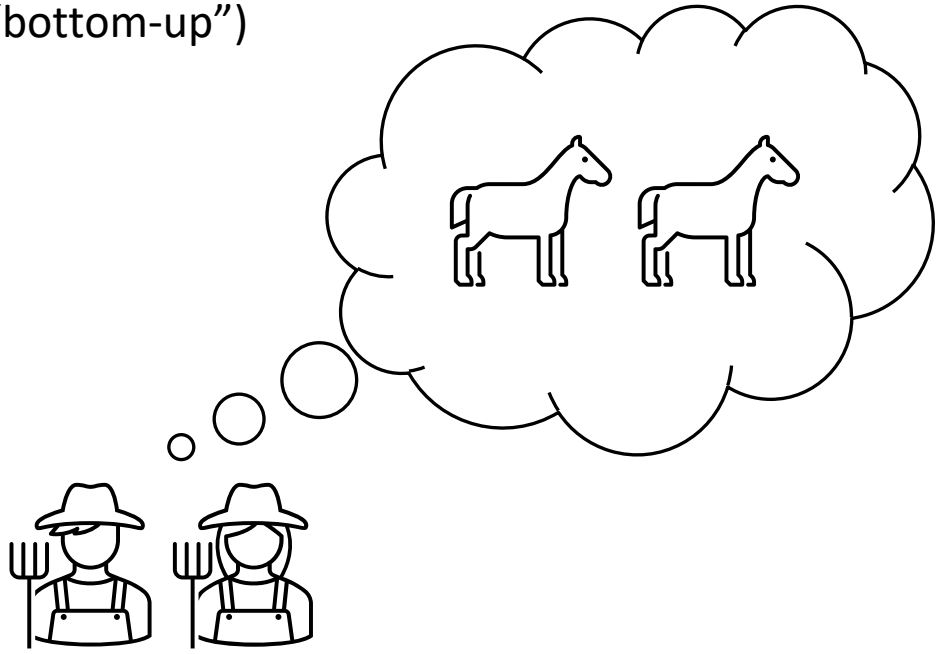
LEADER MICHAEL SIEGRIST & ANGELA BEARTH - ETHZ

CO-LEADER JASMEET KALER – UON

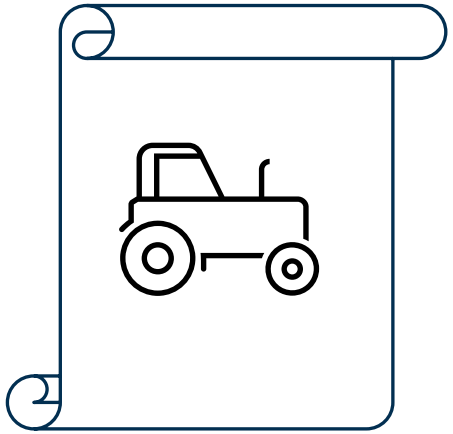
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494.

Stakeholder engagement:
A frequently discussed analogy

Asking farmers what they **want**
("bottom-up")

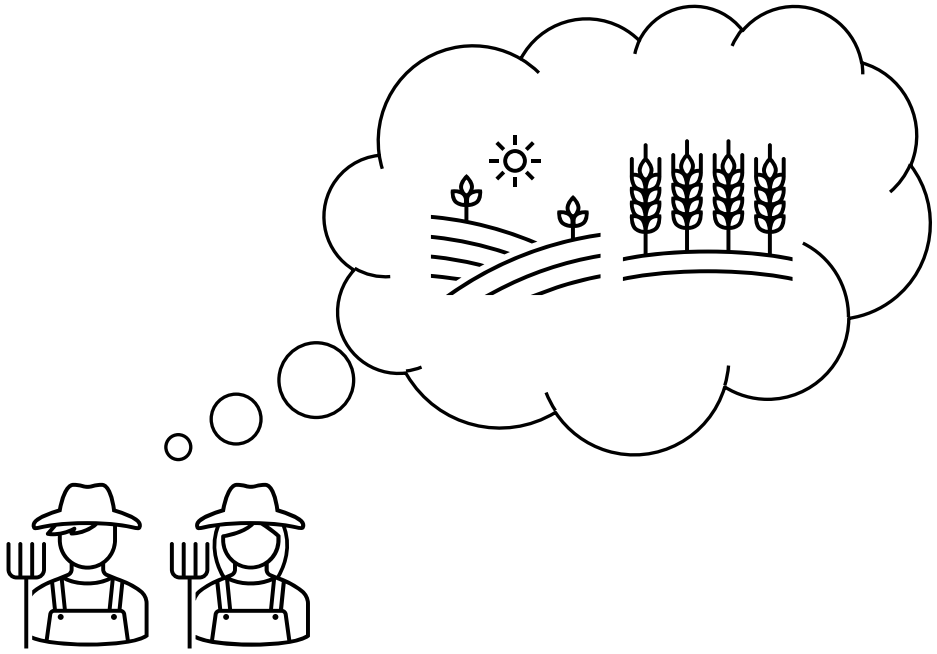


Providing farmers with innovation
("top-down")

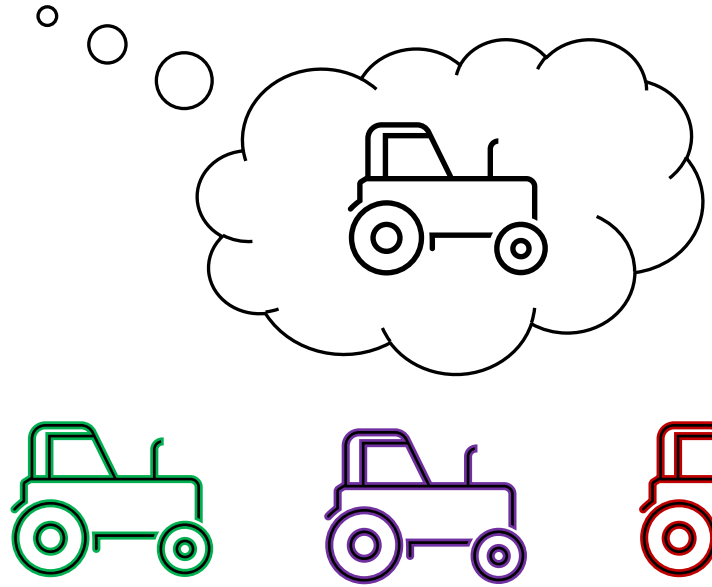


Stakeholder engagement:
A frequently discussed analogy

Asking farmers what they **need**

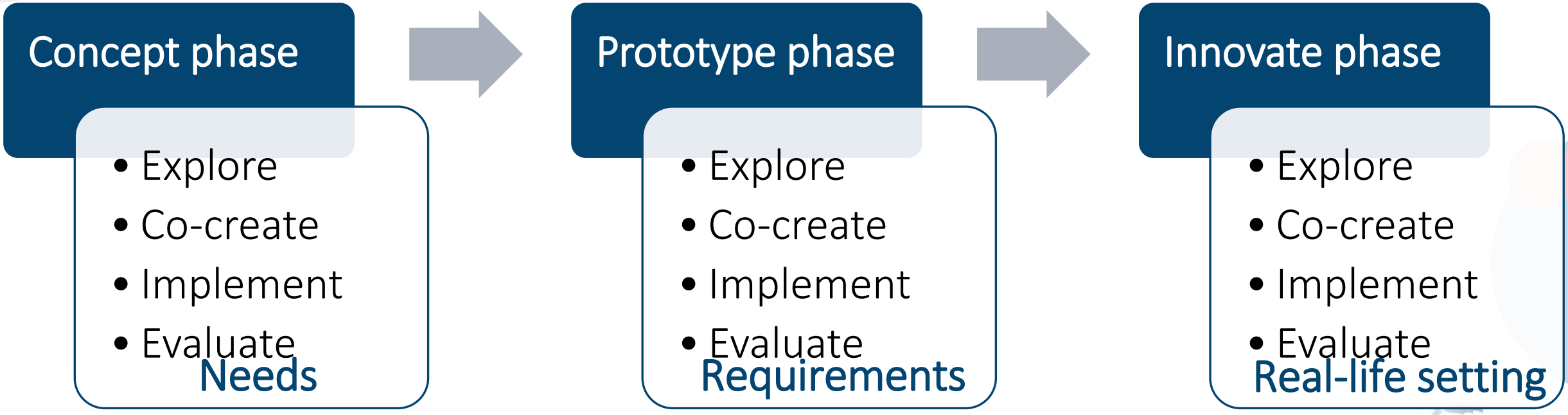


Asking farmers what they think of concepts and prototypes



Living Labs

An approach that guides the planning, execution and evaluation of a project in a user centred and co-creative manner



Work Package 1 - Data identification, characterisation and acquisition

Miel Hostens, Ghent University — WP1 leader
Céline Faverjon, AUSVET — WP1 co-leader

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494.

Objectives of WP1

Explore the different approaches for data access and data usage to support animal health via:

- Assess availability and suitability of data
- Develop a common ontology
- Develop and test alternate approaches for data access and define best practices

Development of alternate approaches for data access

Each of the alternative approaches will be documented, evaluated and discussed to develop guidelines and recommendations using the knowledge acquired during the project

Direct Data Sharing	Centralized Data Exchange (Federated Querying)	Privacy Preserving Data Analytics
• Default approach within DECIDE • To be included in the evaluation and comparison of the alternative approaches	• To be implemented from scratch for at least one pilot implementation	• Federated Learning approach for privacy preservation • Code-to-data instead of Data-to-code approach

WP2 - Methods for data analysis and modelling (to provide early warning signals)

WP LEADERS ANDERS R. KRISTENSEN & DAN B. JENSEN –UCPH

WP CO-LEADER PAULINE EZANNO - INRAE



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494.

What is WP2 about?

- Multivariate and/or multi-level **dynamic monitoring models** that are generalizable to multiple cases (UCPH)
- Disease-specific **mechanistic models** to simulate pathogen spread and syndrome occurence (INRAE)
- An **inference algorithm** to connect data and mechanistic models (INRAE)
- **Warning systems** based on both the monitoring and mechanistic models (UCPH)

WP4 - Multidimensional burden of disease metric and prioritization of interventions

LEADER WILMA STEENEVELD(UU)

CO-LEADER JONATHAN RUSHTON,WILL GILBERT (UOL)



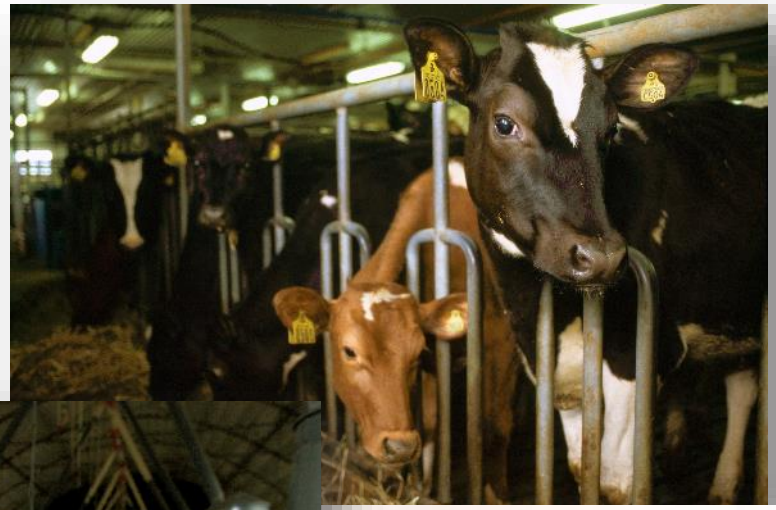
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494.

Tasks

- Determine the multidimensional burden of disease
- Loss and expenditure frontiers of the causes and risk factors of diseases
  - current levels of allocation
  - additional costs and benefits of interventions (e.g. vaccination, medicine, management).
- Relationship between health, diseases and welfare

DE CIDE

WP 3 - Integration of data tools in disease control programs



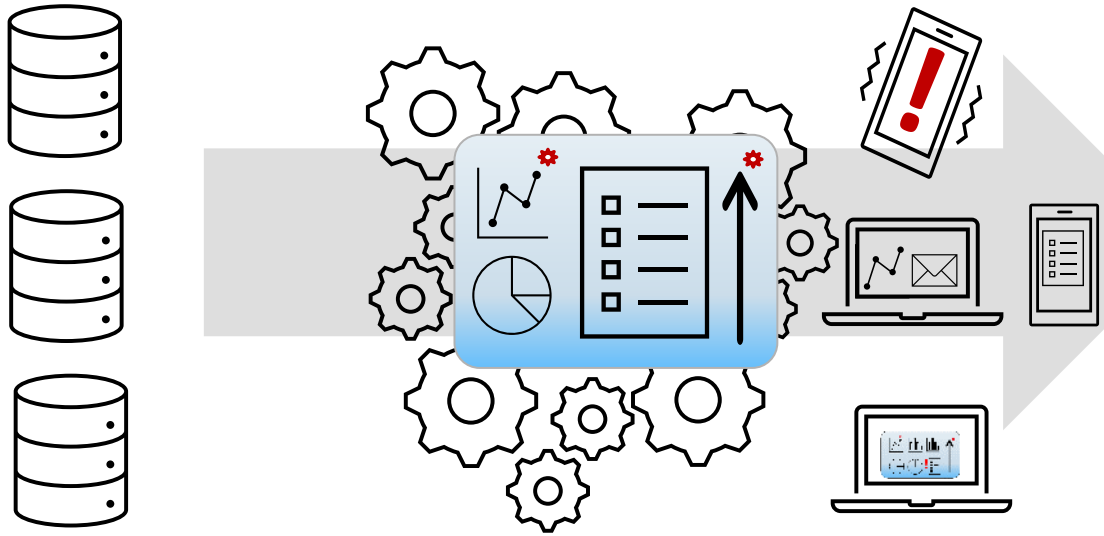
WP-LEAD: JENNY FRÖSSLING (SVA)

CO-LEAD: BRITT BANG JENSEN (NVI)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494.

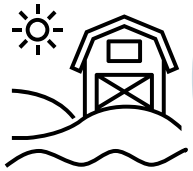
Integration of data tools

DATA



USERS

DECISIONS



Concluding remarks

- The DECIDE project integrates science with practise
  - Sound science
  - Innovative tools for different users
- Prioritizing diseases and control measures for policy and research agenda's
  - Ranking infectious endemic diseases
  - Ranking interventions
- Better control of endemic infectious diseases is an important pillar of sustainable animal production

DE CIDE

brings together 19 partners from 11 countries

Universiteit Utrecht

UNIVERSITY OF COPENHAGEN

UNIVERSITEIT GENT

UNIVERSITY OF LIVERPOOL

ETH zürich

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

SVA

INRAE
la science pour la vie, l'humain, la terre

Veterinærinstituttet
National Veterinary Institute

IRTA CReSA
Centre de Recerca en Sanitat Animal

SRUC

ahi Animal Health Ireland

INSTITUT DE L'ELEVAGE idele

INNOVATION for AGRICULTURE

GD

AUSVET Europe

SLW BIOLAB
Weterynaryjne Laboratorium Diagnostyczne

LELY

accelopment
takes you further

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000494.