aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

'Automated monitoring of pig and chicken welfare at the slaughterhouse – tracing back to farm, transport and slaughter

THE AWISH PROJECT

EAAP 2024
session 9 "Alternative production systems and free communications in animal behaviour and welfare"

Funded by the European Union

www.awish-project.eu
awish@ilvo.vlaanderen.be

Challenge

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Animal welfare

- Societal and moral demand for improved animal welfare
- Combined with other aspects of sustainable livestock production
- 82% of Europeans think that farm animals should be better protected

Monitor

- Legislation & quality assurance schemes: resource-based (*potential* welfare)
- Complement with animal-based measures (*actual* welfare)
- **How to monitor animal-based welfare indicators objectively and cost-efficiently on a large scale throughout Europe?**

General

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

aWISH

Horizon Europe project
Research and Innovation Action

8 000 000 € budget

24 partners | **11** countries

01 Nov 22 - 31 Oct 26

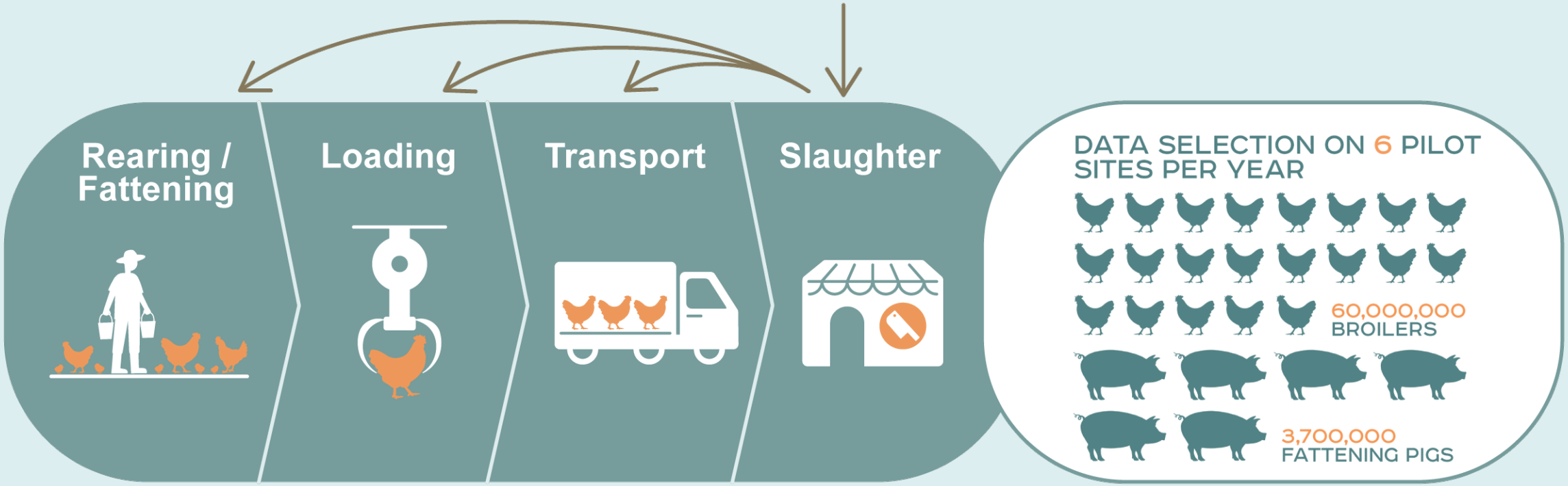
Partners

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

General aim

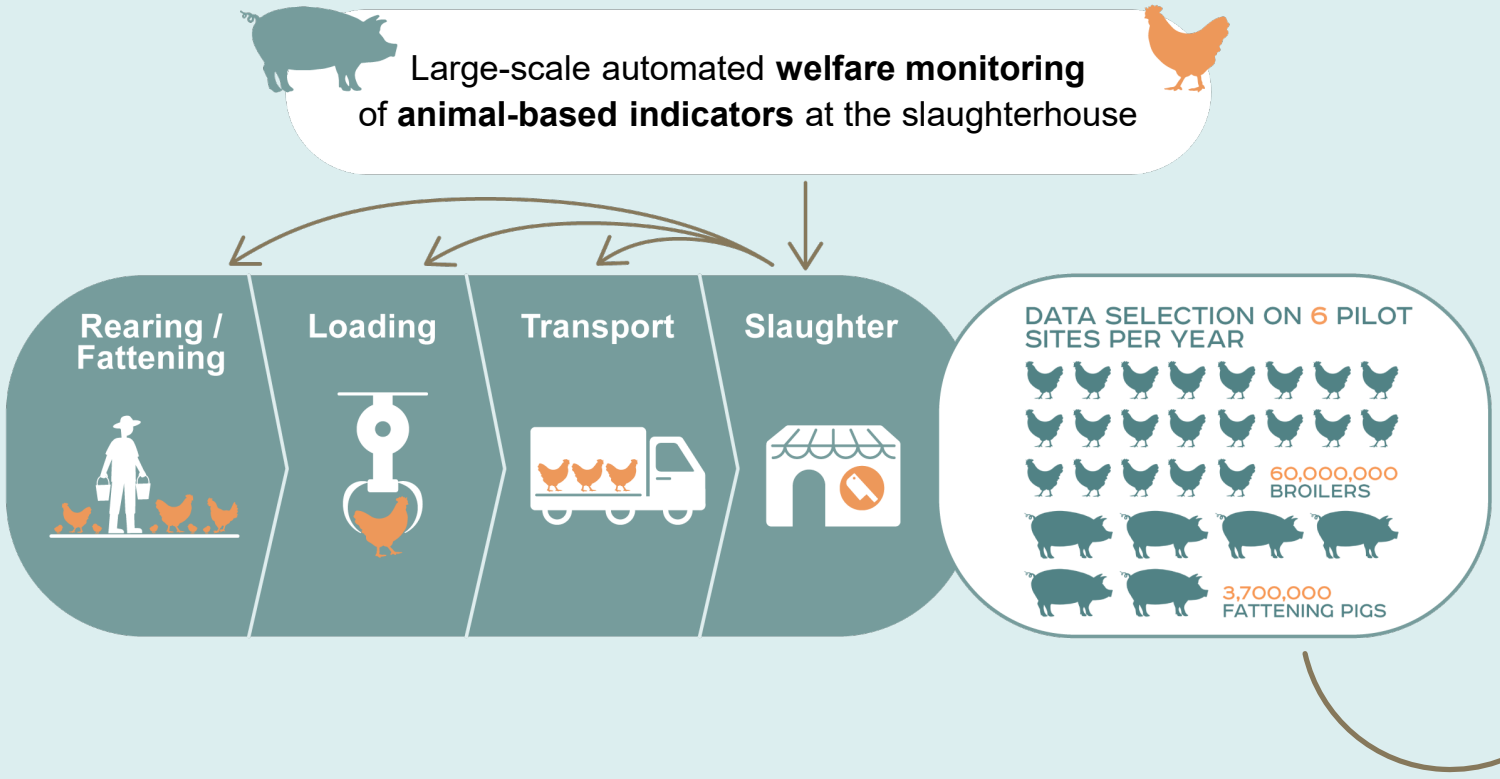
aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Large-scale automated **welfare monitoring** of **animal-based indicators** at the slaughterhouse



Why broilers and pigs?

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE



Large scale effect

- Most numerous species in EU
- Serious welfare problems during all stages

Short rearing period

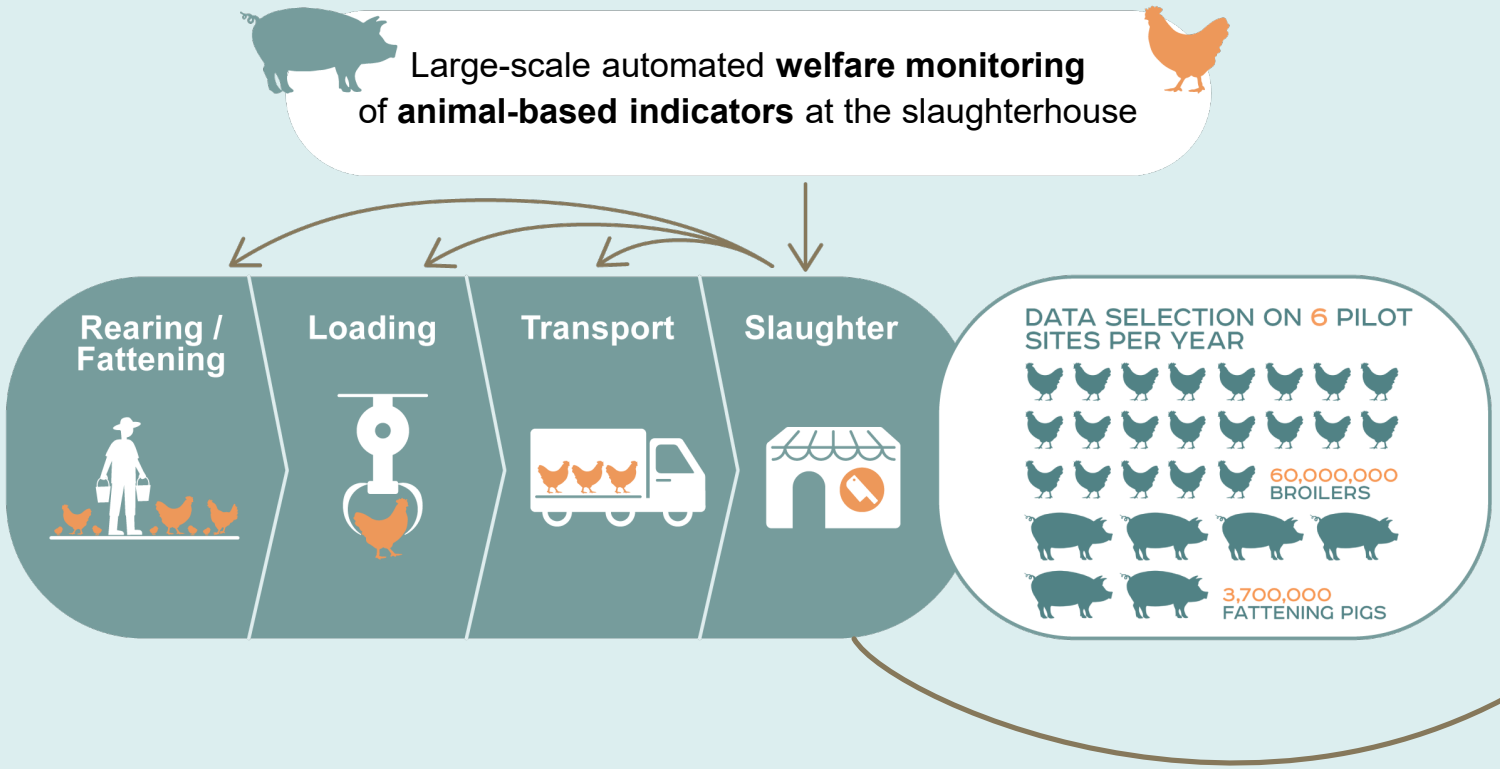
- Limited monitoring time
- Fast corrective actions
- Similar slaughter age

Expansion & adoption to other species

- 2 types of animals that differ in many aspects

Why monitoring @slaughterhouse?

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE



Centralized

- Large amount of animals & data
- Cost-efficient & standardised
- Comprehensive (end-of-life)
- No bio-security risks
- Potential for automation

Complement with

- Routine data
- Measurements on-farm
- Measurements during transport

Pilots

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

	Pilot No.	Pilot Name	Scientific Lead	Phase
	Pilot 1	Vion	UU	1st phase
	Pilot 2	Batallé	UAB	1st phase
	Pilot 3	Duc	Itavi	1st phase
	Pilot 4	Plukon	IGBZ	1st phase
	Pilot 5	Grossfurtner	Vetmed	2nd phase
	Pilot 6	Carnex	BioSense	2nd phase

Pilots • Pilot 1

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Short overview general pig processing and potential sensor technology

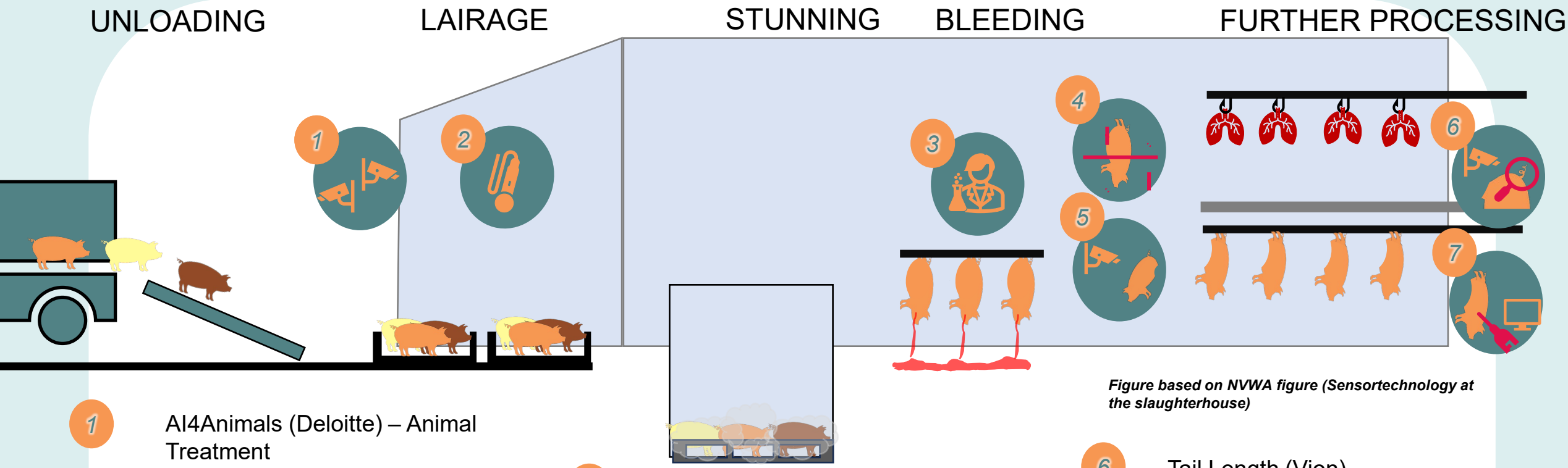


Figure based on NVWA figure (Sensortechnology at the slaughterhouse)

1. AI4Animals (Deloitte) – Animal Treatment
2. STREMODO (FBN) – Stress Vocalizations
3. IGFBPs (FBN) – Stress level in exsanguination blood
4. AUTOFOM3 (Carometec) – Backfat and Muscle Depth Across Carcass
5. PigInspector (CLK) – Ear, Tail and Skin Lesions
6. Tail Length (Vion)
7. CGM Insertion Probe – Backfat and Muscle Depth

Pilots • Pilot 1

NOVEL

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Technology provider

CLK GmbH
Bildverarbeitung & Robotik

Pig Inspector

NAME
PigInspector

WHAT DOES IT MEASURE?
Ear lesions, tail lesions, tail length and skin lesions on the back

Pilots • Pilot 1

NOVEL

FBN IGF blood parameters

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Dr. Manteuffel
Research Institute for Farm Animal Biology
Wilhelm-Stahl-Allee 2
18196 Dummerstorf / Germany

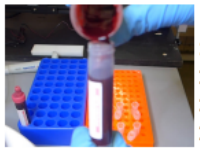
Tel.: +49 38208 68811
E-Mail: christian.manteuffel@fbn-dummerstorf.de

Funded by the European Union

Blood Plasma Procedure

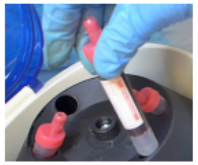
Bloedplasma procedure
Procedura pentru plasma sanguină
Процедура для плазми крові

- 6 pigs per charge
- 3 male and 3 female
- identify the age of the pigs
- 6 varkens per lading
- 3 mannelijke en 3 vrouwelijke
- Identificeer de leeftijd van de varkens
- 6 porci pe încărcătură
- 3 masculi și 3 femele
- Identificați vârsta porcilor
- 6 свиней на зарядку
- 3 самці та 3 самки
- Визначте вік свиней



- decant into an EDTA monovette
- use fresh slaughter blood
- decanteer in een EDTA-monovette
- gebruik vers slachtbloed
- se decantează într-o monovetă EDTA
- utilizează sânge proaspăt
- зцджують у моновету з ЕДТА
- використовувати свіжу кров

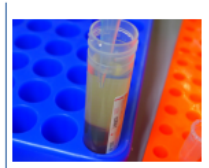
- break off the piston
- turn the monovette 180° five times to dissolve the EDTA
- breek de zuiger af
- draai de monovette vijf keer 180° om de EDTA op te lossen
- rupeți pistonul
- rotiți monovârful la 180° de cinci ori pentru a dizolva EDTA
- відламати поршень
- поверніть моновету на 180° п'ять разів щоб розчинити ЕДТА



- label the monovettes and tubes
- note the label and the metadata
- load the centrifuge evenly
- label de monovettes en buizen
- noteer het label en de metagegevens
- laad de centrifuge gelijkmatig
- etichetați monovârfurile și tuburi
- notați eticheta și metadatele
- încărcați uniform centrifuga
- позначте моновети і трубки
- зверніть увагу на етикетку та метадані
- рівномірно завантажте центрифугу

Preset **P1**
Voorinstelling **P1**
Preselecție **P1**
Попередня конфігурація **P 1**

- 15 min.
- 2000 g / ~ 4400 rpm



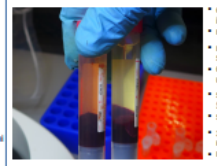
- pipette supernatant from the top
- use a new pipette tip for each pig
- pipetteer het supernatant van de bovenkant
- gebruik een nieuwe pipetpunt voor elk varken
- se pipetează supernatantul din partea superioară
- folosiți un vârf de pipetă nou pentru fiecare porc
- піпеткою надсадову рідину зверху
- використовуйте новий наконечник піпетки для кожної свині

- fill 3 tubes twice each
- 3x1000 µl per pig
- freeze the tubes in boxes
- vul 3 buisjes elk tweemaal
- 3x1000 µl per varken
- vries de buisjes in dozen in
- umpleți 3 tuburi de două ori fiecare
- 3x1000 µl per porc
- congelați tuburile în cutii
- заповнити 3 пробірки двічі кожну
- 3x1000 мкл на свиню
- заморозити пробірки в коробках

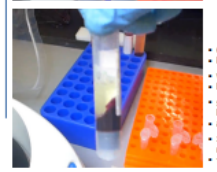
Quality Advices

Kwaliteitsadvies
Sfaturi de calitate
Якісні поради

- **Mix the blood with EDTA as fast as possible!**
- Press the pipette gently to avoid a contamination above the tip.
- metadata: date, time, farm, transporter, age, sex
- **Meng het bloed zo snel mogelijk met EDTA!**
- Druk voorzichtig op de pipet om besmetting boven de tip te voorkomen.
- metagegevens: datum, tijd, bedrijf, vervoerder, leeftijd, geslacht
- **Amestecați sângele cu EDTA cât mai repede posibil!**
- Apăsați ușor pipeta pentru a evita o contaminare deasupra vârfului.
- metadate: data, ora, ferma, transportator, vârstă, sex
- **Змішайте кров з ЕДТА якомога швидше!**
- Обережно натискайте на піпетку, щоб уникнути забруднення над кінчиком.
- метадані: дата, час, ферма, транспортер, вік, стать

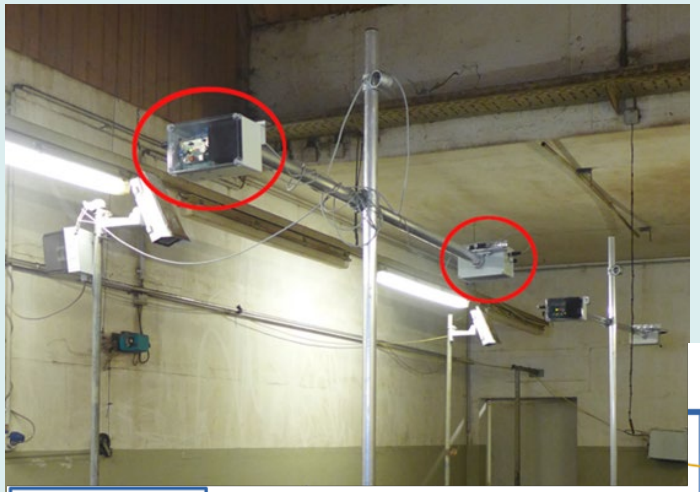


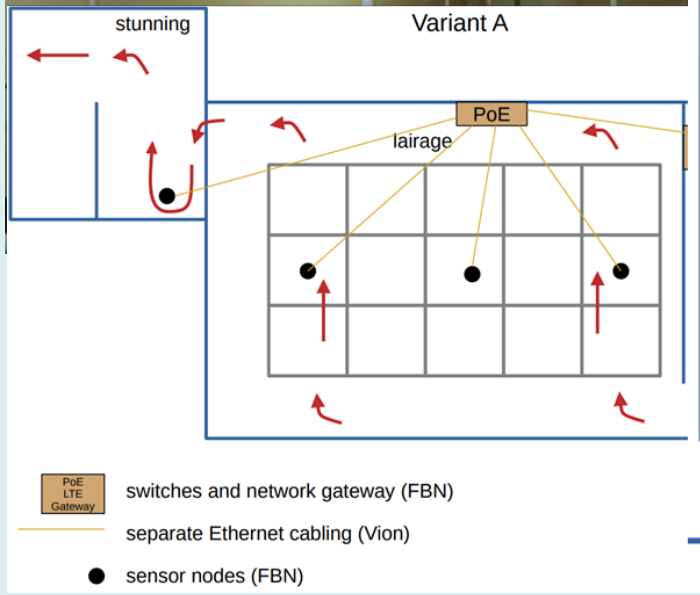
- collect new blood if the supernatant is reddish (haemolytic)
- redo the whole procedure
- nieuw bloed afnemen als het supernatant roodachtig is
- de hele procedure opnieuw uitvoeren
- să colecteze sânge nou dacă Supernatantul este roșiatic
- se refface întreaga procedură
- зберіть нову кров, якщо надосадова рідина червонуватий
- повторити всю процедуру

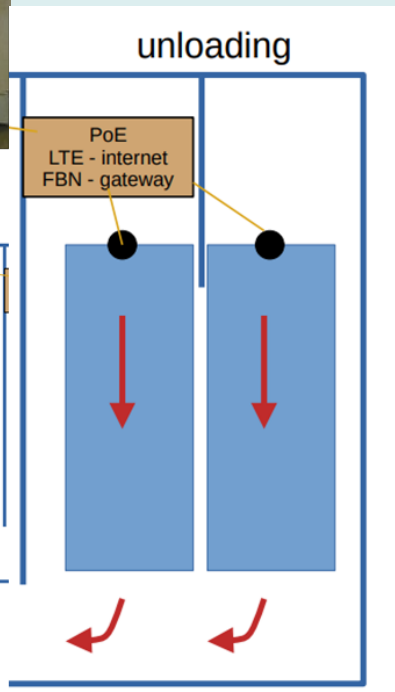


- collect only clear supernatant
- keep away from the deposit
- verzamel alleen helder supernatant
- blijf uit de buurt van het depot
- se colectează numai supernatantul limpede
- a se ține departe de depozit
- збирати тільки прозору надосадову рідину
- тримати подалі від осаду

FBN STREMODO





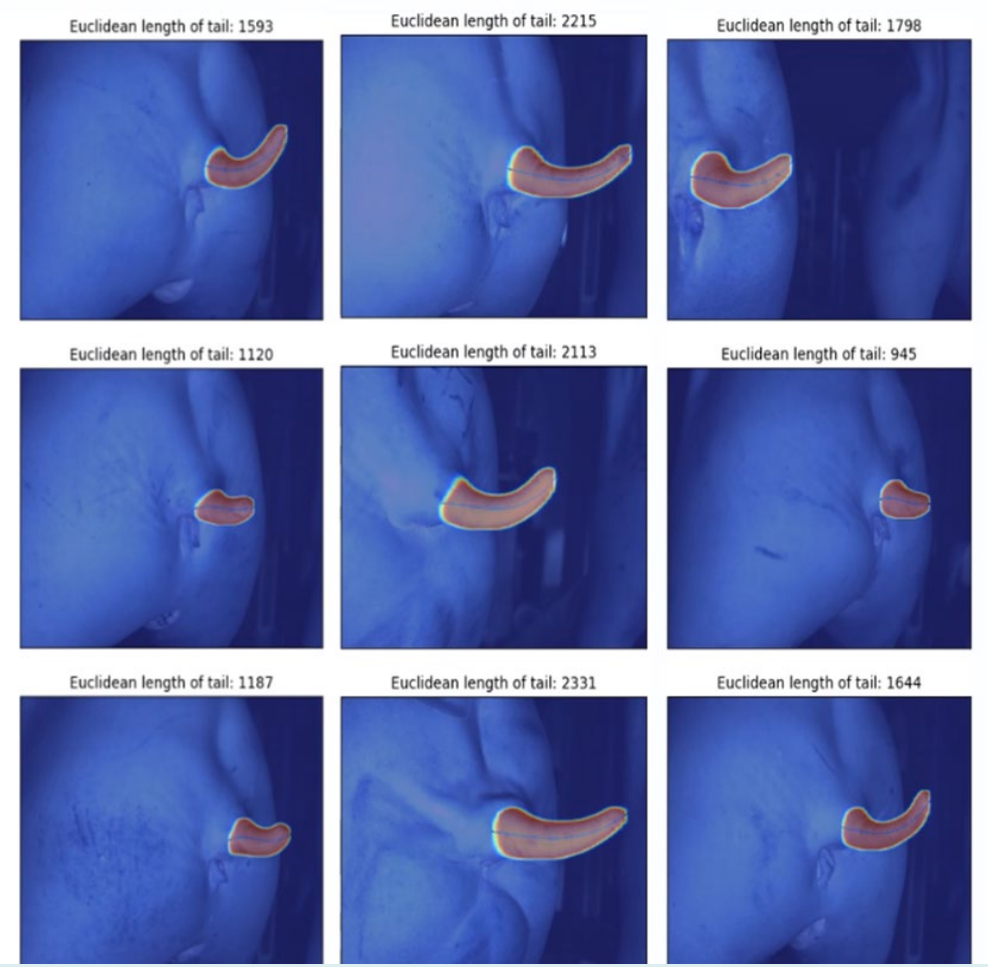


Technology provider

Pilots • Pilot 1

EXISTING

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE



Tail length measurement in slaughter line (Vion)

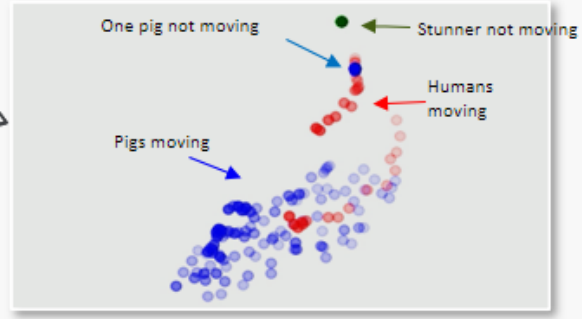
AI4Animals (Deloitte)

How it works

1 AI solution - detections

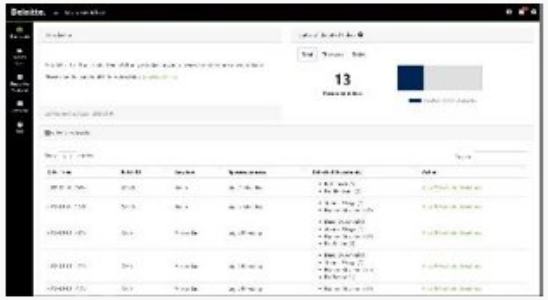
The AI4A algorithm detects animals, people, and objects and how they interact

2 AI solution – movement heatmaps



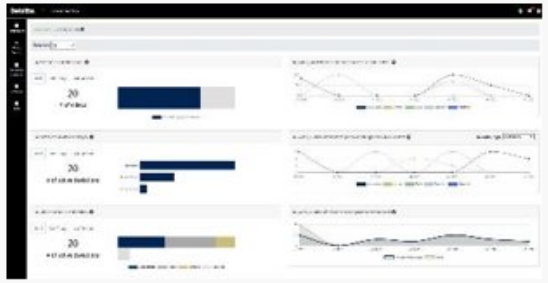
Images are translated into movement heatmaps to detect potential handling issues

3 Dashboard - deviations list review



AI4A selects and aggregates all video recordings containing potential deviations to be reviewed

4 Dashboard - trend reports

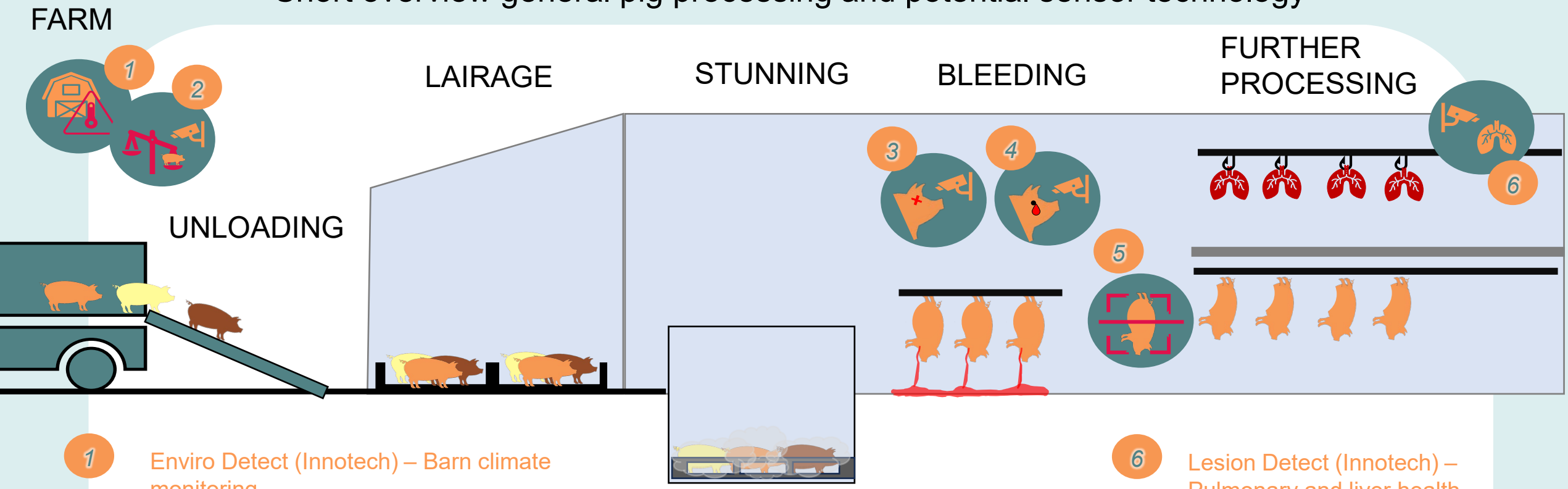


AI4A includes trends reports outlining deviations over time and per slaughterhouse

Pilots • Pilot 2

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Short overview general pig processing and potential sensor technology



1. Enviro Detect (Innotech) – Barn climate monitoring
2. Weight Detect (Innotech) – Weight predicting via camera
3. Stunning Effectiveness (Wel2be)
4. Tear Staining (Wel2be)
5. AUTOFOM3 (Carometec) – Backfat and Muscle Depth Across Carcass
6. Lesion Detect (Innotech) – Pulmonary and liver health monitoring

Pilots • Pilot 2

NOVEL

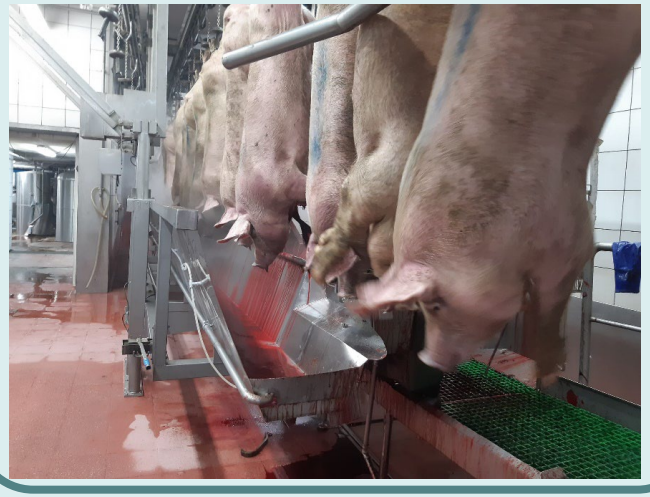
aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Technology provider

wel2be

NAME
Stunning effectiveness for pigs

WHAT DOES IT MEASURE?
Conciousness of pigs after stunning period



NAME
Tear staining sensor

WHAT DOES IT MEASURE?
Tear staining length

Pilots • Pilot 2

NOVEL

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Technology provider

Innotech

NAME
Enviro Detect

WHAT DOES IT MEASURE?
On-farm temperature, relative humidity, ventilation rate, concentrations of ammonia, dust and CO2 as well as emission of ammonia and dust.

NAME
Weight Detect

WHAT DOES IT MEASURE?
Contactless weighing system

NAME
Lesion Detect

WHAT DOES IT MEASURE?
Lung and Liver Lesions (score)

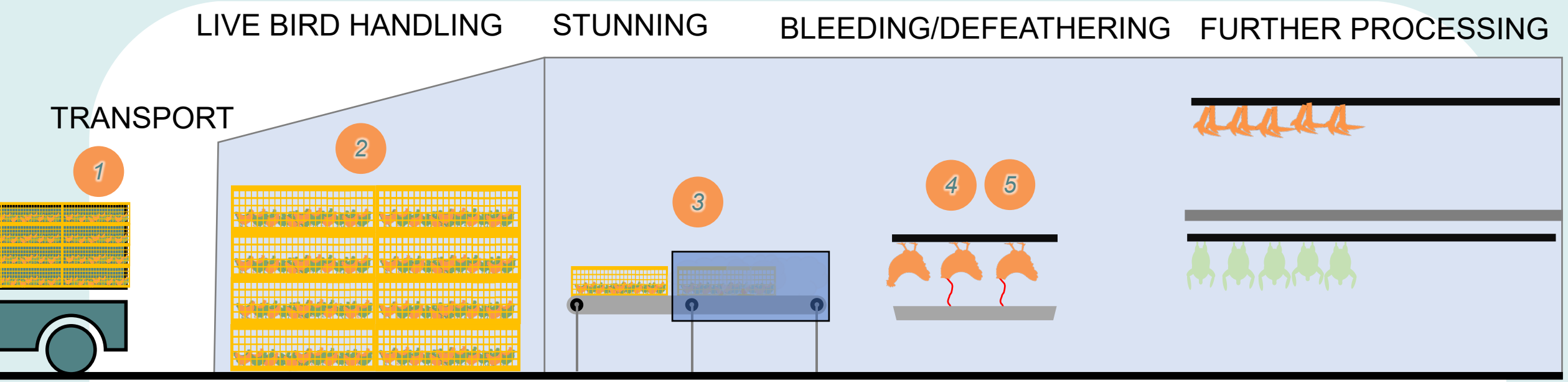
Pilots • Pilot 3

PLUKON food group

ITAVI | L'INSTITUT DES FILIÈRES AVICOLE, CUNICOLE ET PISCICOLE

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Short overview general broiler processing and potential sensor technology



1. Transport monitoring (ITAVI)
2. Ebroilertrack Sound (ITAVI) – Broiler Vocalization
3. Stunning Effectiveness (Wel2be)
4. ChickenCheck Hockburn (CLK) – Hockburn
5. ChickenCheck Footpad (CLK) – Footpad lesions

ON FARM

6. EBENE (ITAVI) – App for assessing welfare on farm
7. Ebroiler track image (ITAVI) – individual broiler activity on farm

Pilots • Pilot 3

NOVEL

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Technology provider

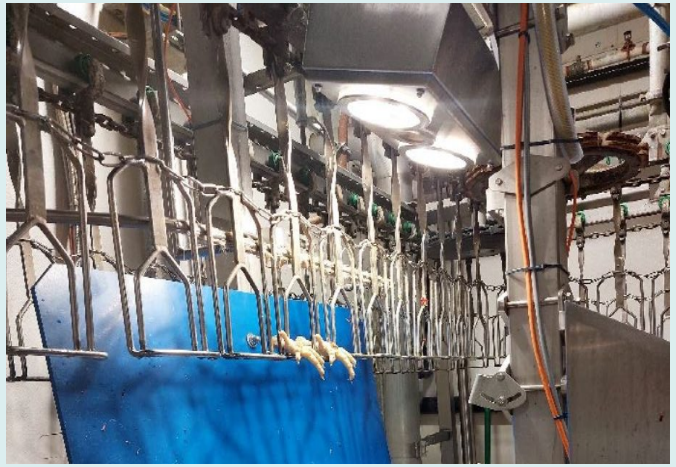
CLK GmbH
Bildverarbeitung & Robotik

NAME
ChickenCheck Hockburn

WHAT DOES IT MEASURE?
Hockburns

NAME
ChickenCheck Footpad

WHAT DOES IT MEASURE?
Footpad lesions



Pilots • Pilot 3

NOVEL

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Technology provider

ITAVI | L'INSTITUT DES FILIÈRES AVICOLE, CUNICOLE ET PISCICOLE

NAME
Ebroilertrack image – individual broiler activity on farm

WHAT DOES IT MEASURE?
Individual broiler activity on farm

NAME
Ebroilertrack Sound – Broiler Vocalization

WHAT DOES IT MEASURE?
Vocalization related to stress in the waiting area

NAME
EBENE – App for assessing welfare on farm

WHAT DOES IT MEASURE?
On farm welfare

NAME
Transport monitoring

WHAT DOES IT MEASURE?
CO_2, Temperature, Humidity

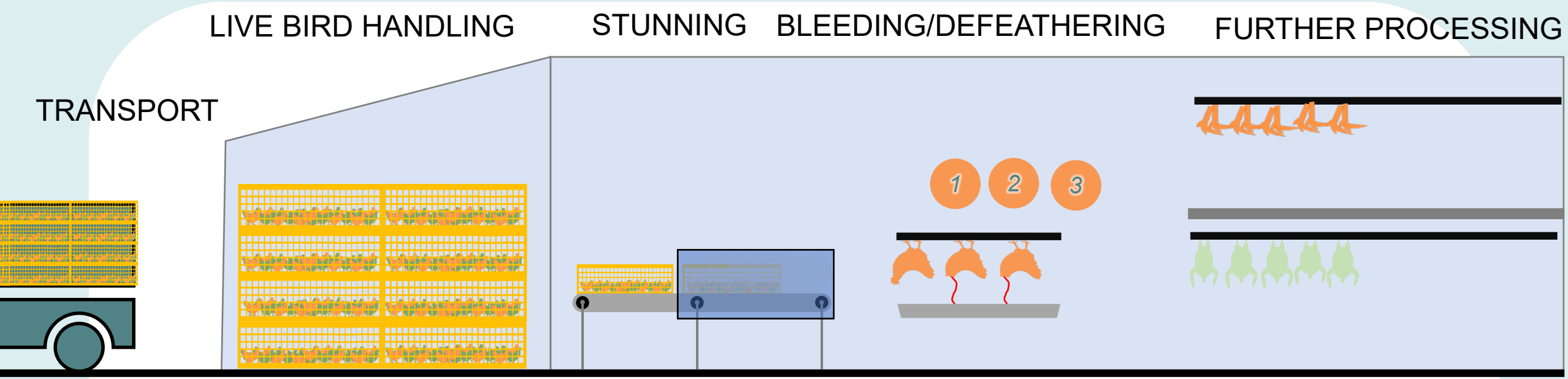
Pilots • Pilot 4

PLUKON food group

INSTYTUT GENETYKI I BIOTECHNOLOGII ZWIERZĄT Polskiej Akademii Nauk
JEDNOSTKA NAUKOWA KATEGORII A+

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Short overview general broiler processing and potential sensor technology



1 ChickenCheck Hockburn (CLK)

2 ChickenCheck Catch Damage (CLK)

3 ChickenCheck Footpad (CLK)

ON FARM

4 EBENE (ITAVI/IGBZ) – App for assessing welfare on farm

Pilots • Pilot 4

NOVEL

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Technology provider

CLK GmbH
Bildverarbeitung & Robotik

NAME
ChickenCheck Hockburn

WHAT DOES IT MEASURE?
Hockburns

CLK Hock burn camera in Sieradz

Pilots • Pilot 4

NOVEL

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Technology provider

CLK GmbH
Bildverarbeitung & Robotik

NAME
ChickenCheck Footpad

WHAT DOES IT MEASURE?
Footpad lesions

NAME
ChickenCheck Catch Damage

WHAT DOES IT MEASURE?
Catch damage on wings, breast, legs
Scratches on the back

CLK Footpad camera Sieradz

Key insights

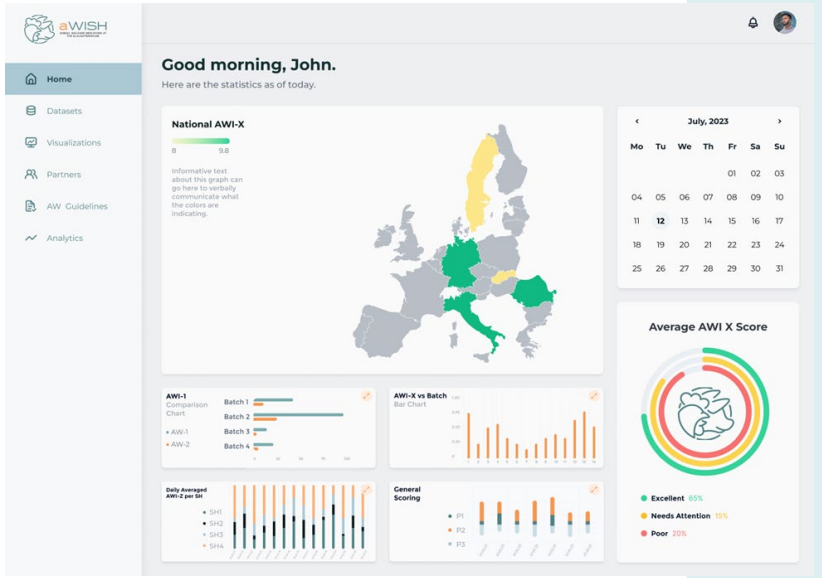
aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Lessons learned

- Automation needs for slaughterhouses
- Every slaughterhouse is different – poses technical challenges
- Validation procedures needed
- Awareness campaigns for AW assessment at slaughterhouses are needed – but sensitive topic

Future work

- Standardized data collection & validation
- Development feedback loop – user interface
  - +/- 20 chain actors testing in each pilot
- Best Practice Guides
- AW, socio-economic & environmental impact assessment



Expert panel

aWISH
ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

www.awish-project.eu

- Livestock
- Government & NGOs
- Research
- Industry & Retail

Pig & Broilers expert panel

aWISH

ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

Stay up to date?
Join the expert panel?

www.awish-project.eu

awish@ilvo.vlaanderen.be

This project has received funding from the European Union's Horizpn Europe Research and Innovation Program under Grant Agreement No. 101060818

Funded by the European Union