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ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE

awish-project.eu

awish@ilvo.vlaanderen.be

The Future of Animal Welfare Monitoring in the Meat Supply Chain

8 October 2026 – Online Webinar

Funded by the European Union

Program

Funded by the European Union

- **10:00 – 10:10** **Welcome and Introduction**
  (INNOVACC)

- **10:10 – 11:25** **Results from the aWISH and Pilot Experiences**

  RELEVANT RESULTS OF THE AWISH PROJECT

  - Technologies — Noémie Van Noten (ILVO)
  - Animal welfare outcomes — Bas Rodenburg (Utrecht University)
  - Data platform & data-driven welfare monitoring — Kostas Perakis (Ubitech)
  - Best Practice Guides (BPGs) — Maite Jachens (TiHo)
  - Socio-economic implications — Mavis Boimah (Thünen)

  PILOT EXPERIENCES AND KEY AWISH RESULTS

  Pig pilot: Josep Reixach (Batallé) · Broiler pilot: Juliette Zamparini (Plukon)

- **11:25 – 11:35** **Break**

- **11:35 – 12:00** **Opportunities for Future Uptake by the Meat Industry**

  Speaker: Helen Lambert (Eurogroup for Animals)

- **12:00 – 12:45** **Round Table Discussion**

  Animal Welfare Data: Creating Value Across the Meat Supply Chain Moderator: Pol Llonch (UAB)

  PANELLISTS

  - Jordi Canet — Norfrisa
  - Juliette Zamparini — Plukon
  - Annaig Thomas — Symrise
  - Nathan Williams — BBFAW
  - Helen Lambert — Eurogroup for Animals
  - Thomas Banhazi — Innotech Vision

- **12:45** **Closing**

  (UAB / INNOVACC)

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Results from the aWISH project

10:10 – 11:00

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The aWISH technologies

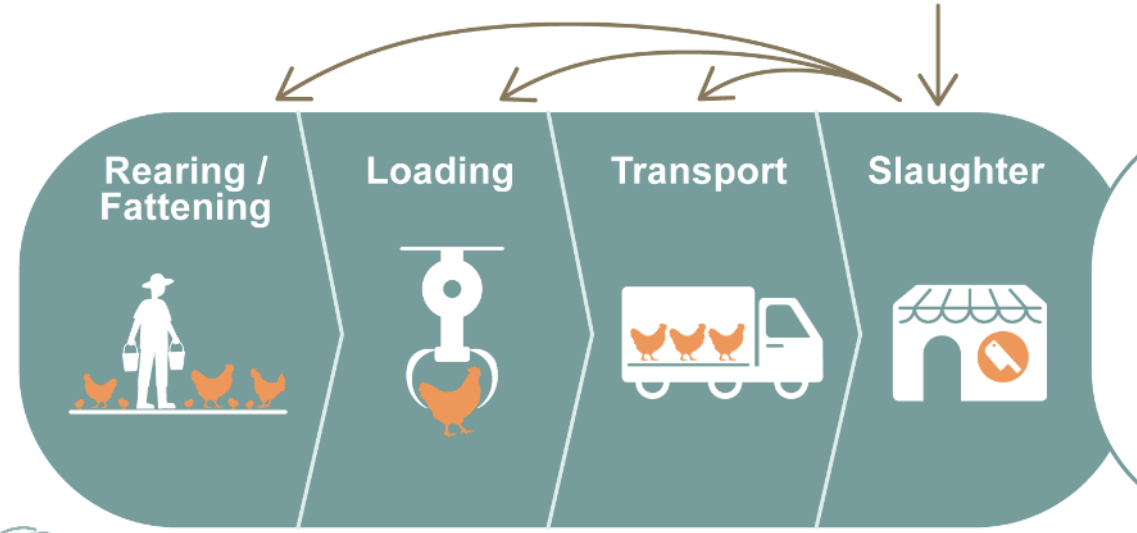
Noémie Van Noten (ILVO)

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The aWISH vision

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



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Horizon Europe project Research and Innovation Action

8 000 000 € budget

28 partners | **11** countries | **6** pilots

01 Nov 2022 - 31 Oct 2026

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Specific objectives & results

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1 Animal Welfare Indicator Catalogue
- Automated AWI
- Routine & existing data sources

2 Pilots and Technologies
- Development new technologies
- Piloting at large scale

3 aWISH Data Platform
- Feedback
- Benchmarking

4 AW Assessment and Improvement
- Intervention studies
- Risk & success factors

5 Best Practice Guides

6 Impact Assessment
- Socio-economic
- Environment

7 Stakeholder Engagement and Overall Impact Assessment

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The aWISH pilots

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Pilot No.	Pilot Lead	Scientific Lead	Phase
Pilot 1	VION	UU	1st phase
Pilot 2	Batallé	UAB	1st phase
Pilot 3	Plukon - Duc	ITAVI	1st phase
Pilot 4	Plukon - Sieradz	IGBZ PAN	1st phase
Pilot 5	Großfurtner - Higelsberger	Vetmeduni	2nd phase
Pilot 6	Carnex	BioSense	2nd phas

16 new technologies
25 new installations



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Sensor technologies – Pig pilots

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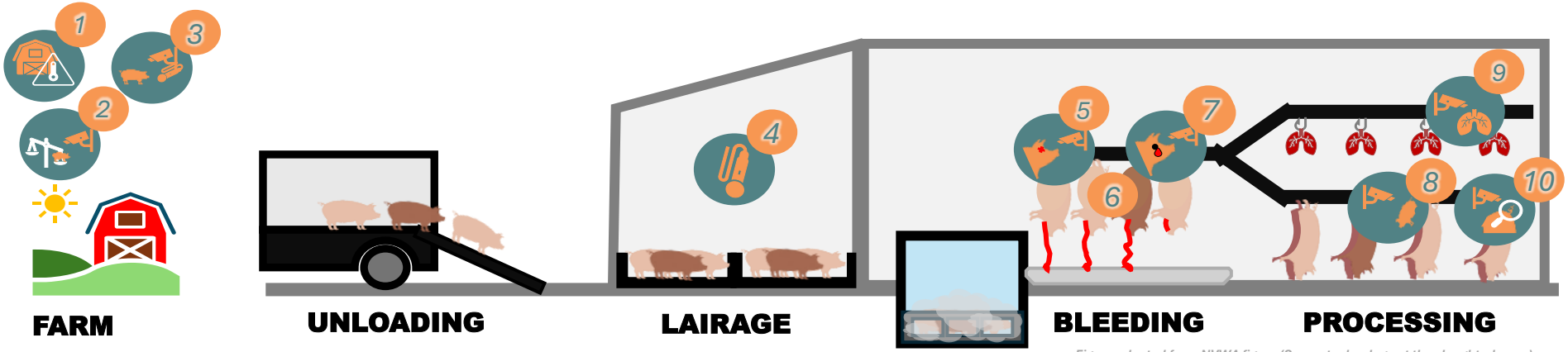
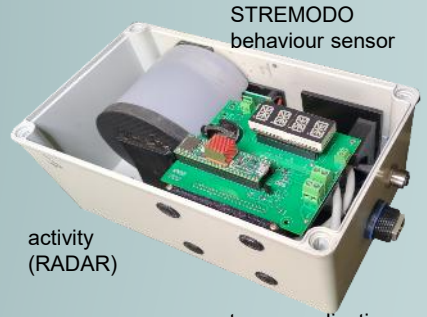


Figure adapted from NVWA figure (Sensortechnology at the slaughterhouse)

1. Enviro-Detect (Innotech) – Barn climate monitoring
2. Weight-Detect (Innotech) – Weight prediction via depth sensor
3. (New) Climate and behaviour sensor (Bitgear) - cough detection module
4. (New) STREMODO (FBN) – Stress Vocalizations
5. (New) Blink AI (Nuna Solutions) – stunning effectiveness
6. IGFBPs (FBN) – Stress level in exsanguination blood
7. (New) Tear Staining (ILVO)
8. (New) Lesion-Detect (Innotech) – Pulmonary health monitoring
9. (New) PigInspector (CLK) – Ear, Tail and Skin Lesions, Tail length
10. (New) Tail length (Vion / Batallé)

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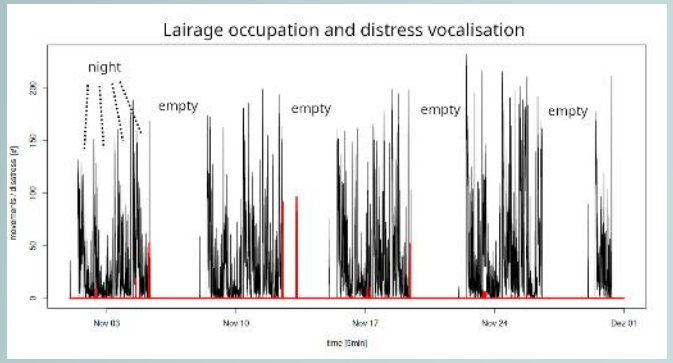
STREMODO TRL = 6



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Purpose

- **Monitoring of distress (group level)**
  - **activity increase**
  - **stress vocalisations**
- **Use cases**
  - **Birth detection / crushing detection (On-farm)**
  - **QC unloading / lairage (Slaughterhouse)**
  - **Aggression / tail-biting (On-farm)**





Challenges

- **Optimal installation spot**
- **Background noise**
- **For validation, link with:**
  - **Temporal data (procedures, batches)**
  - **Spatial data (pen level)**

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BlinkAI TRL = 6

BlinkAI

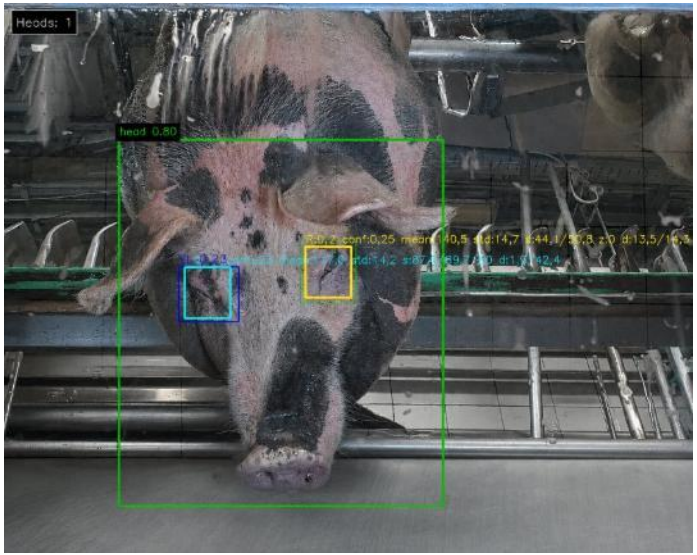
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Purpose

Detection of consciousness after CO_2 stunning:

- Based on blinking patterns (corneal reflex)
- After stimulus with air flow in the eye





Real-time anatomical localisation under industrial slaughterhouse conditions

Challenges

- Variable lighting conditions
- Animal position
- Industrial line speed
- Humidity and dirt
- Low number of positive cases (~0,03%)

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nunasolutions

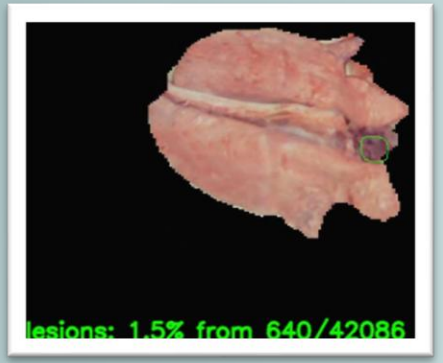
Lesion-Detect TRL = 6

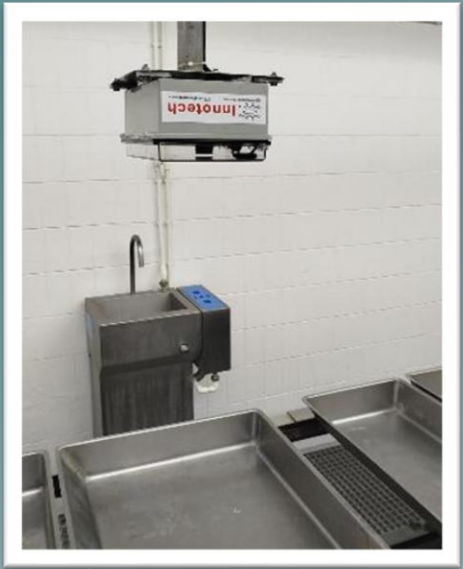
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Purpose

Classification of lesion severity on lungs

- According to according to the Australian PHMS scoring system
- 0 = not affected → 50 = fully impacted by lesions







Challenges

- Position of the lungs:
  - Laying in trays
  - vs Hanging (partial occlusions
- Processing power limitation
- Hardware exposure to water

Sensor technologies –Broiler pilots

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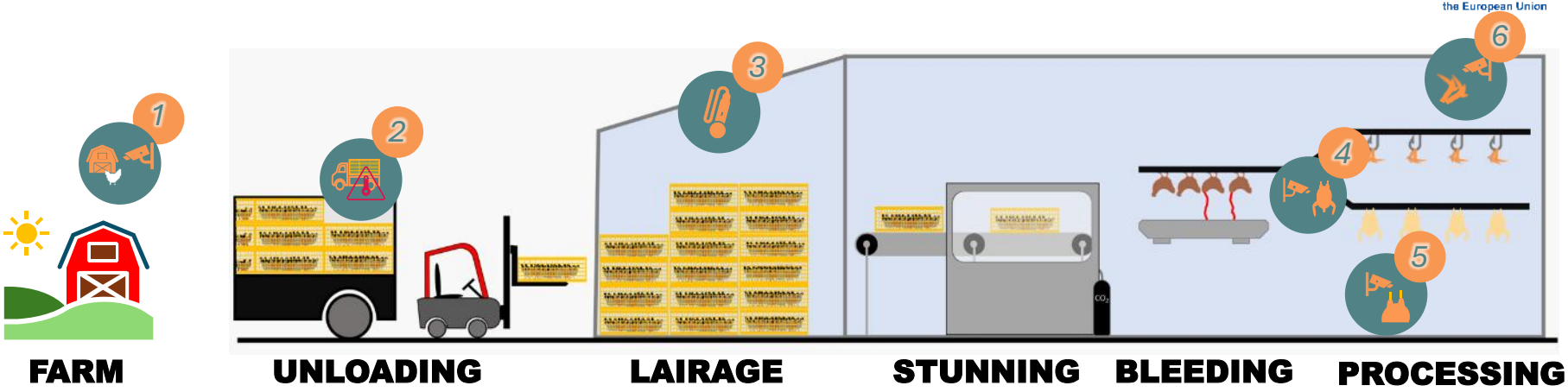


Figure adapted from NVWA figure (Sensortechnology at the slaughterhouse)

New 1 EBroilerTrack Image (ITAVI) – Individual broiler activity on farm

New 2 Transport monitoring (ITAVI) – model for heat stress

New 3 EBroilerTrack Sound (ITAVI) – Broiler vocalizations

New 4 ChickenCheck Catch Damage (CLK) – Catching damage (bruises and fractures) and scratches

5 ChickenCheck Hockburn (CLK) – Hockburns

6 ChickenCheck Footpad (CLK) – Footpad dermatitis

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ChickenCheck Catch Damage TRL = 7

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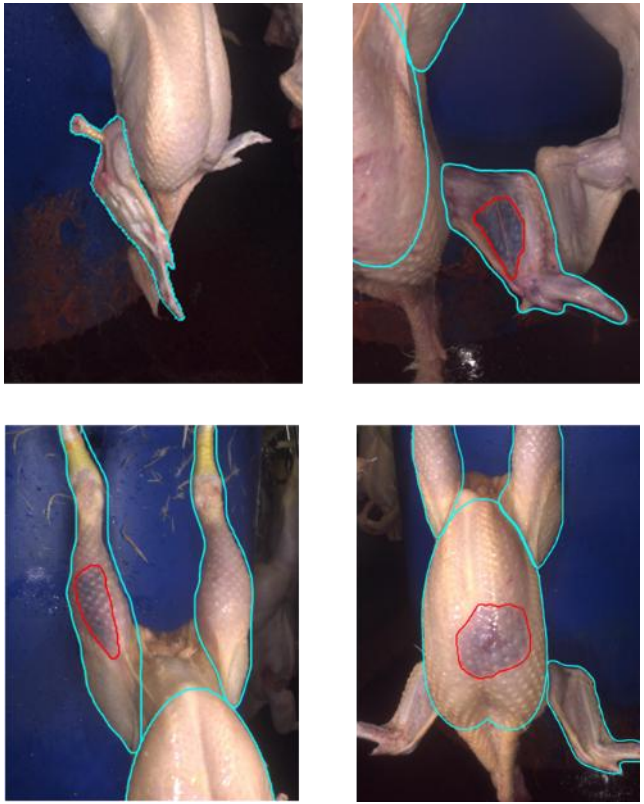
Purpose

Detection of carcass damage:

- Broken wings
- Hematomas on wings, breast & legs

Challenges

- Bad image quality (improper cleaning of sensor)
- High line speed (18 000 birds/h)
- Distinction between lesions:
  - Old lesions (before catching/transport)
  - New/ process lesions



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CLK GmbH
Bildverarbeitung & Robotik

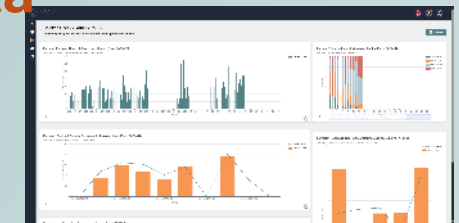
Conclusions

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The slaughterhouse =
a central, though challenging location for automated animal welfare monitoring

- Harsh environment (dust, water, steam, blood)
- High speed processes
- Limited physical space for sensor installation
- Every slaughterhouse is different:
  → sensor development requires time
  →validation under specific circumstances

With potential to generate
a huge amount of routine welfare data
→ aWISH data platform



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Thank you!

noemie.vannoten@ilvo.vlaanderen.be

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Animal welfare outcomes

Bas Rodenburg (Utrecht University)

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From technologies to welfare monitoring

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- Six pilots (four pig pilots, two broiler pilots)
- In each pilot, data were collected on farm and at slaughter



Central question:

- Can the automatically collected welfare data at the slaughterhouse be used as an indicator of overall welfare?

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Broiler pilots: focus on ChickenCheck system

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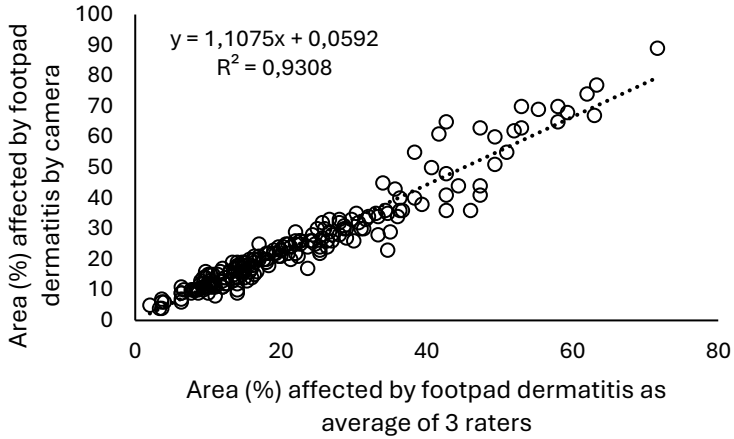
Foot pad dermatitis

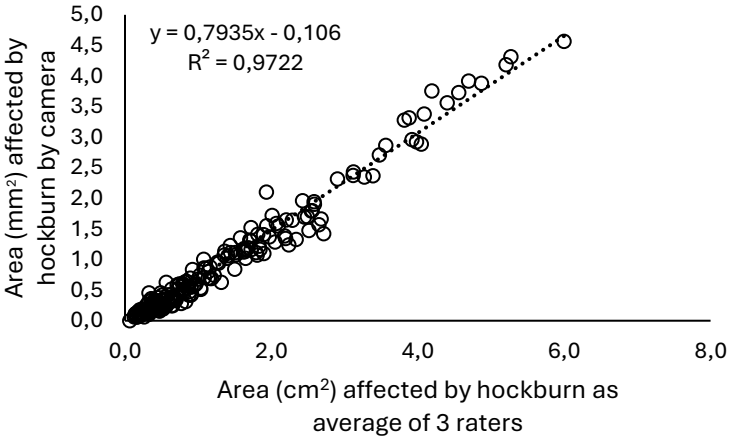
Hock burn

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Validation study

- Data from Poland and from France
- Three human raters vs. ChickenCheck system
- Strong correlation between area selected by human assessor and by system





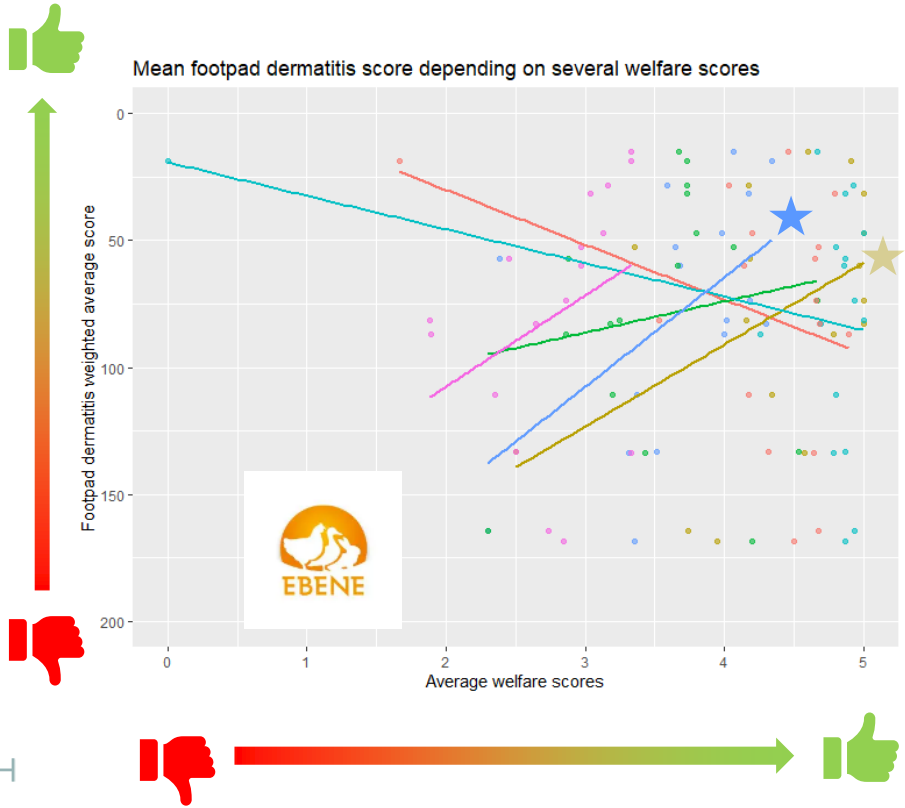
Van Staaveren et al. (2026)
https://doi.org/10.1016/j.psj.2026.106968

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Correlations on-farm welfare scores (27 flocks, France) and FPD ChickenCheck scores

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Better footpad scores:

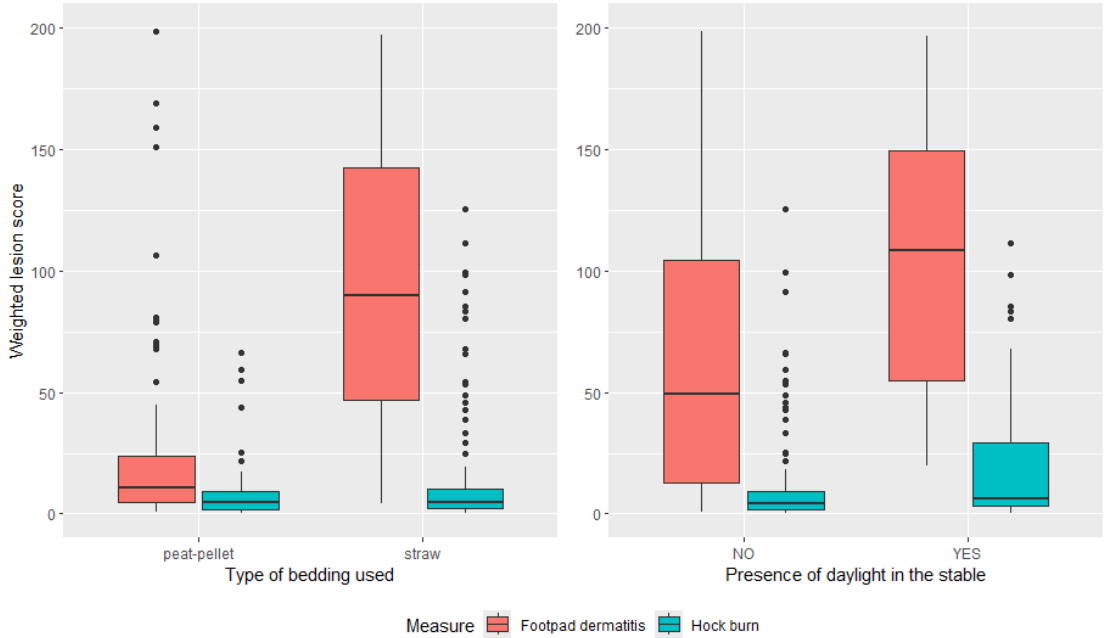
- Better litter quality
- More positive social behaviour (tendency)

Manet et al (in prep)

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Correlations farm management and ChickenCheck (285 flocks, Poland)

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Better footpad scores:

- Peat pellets over straw

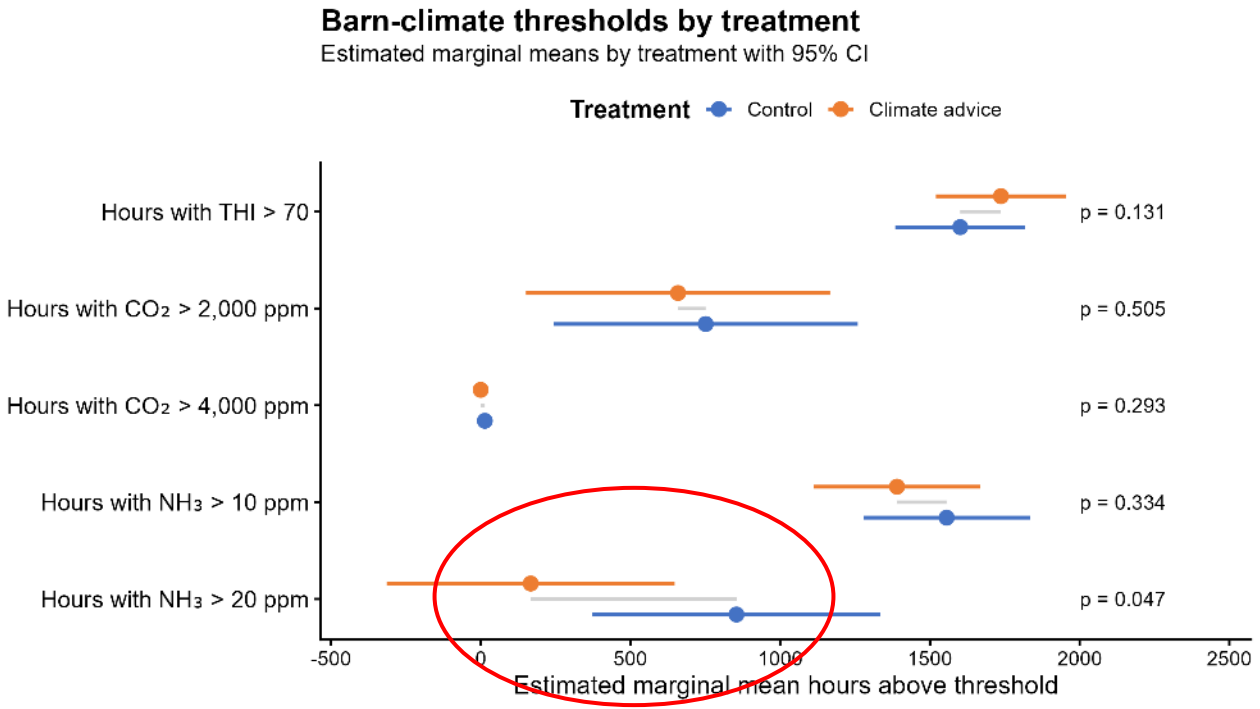
Better hock burn scores:

- No daylight over daylight

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Pigs: compared rounds with/without climate advice (10 Dutch farms)

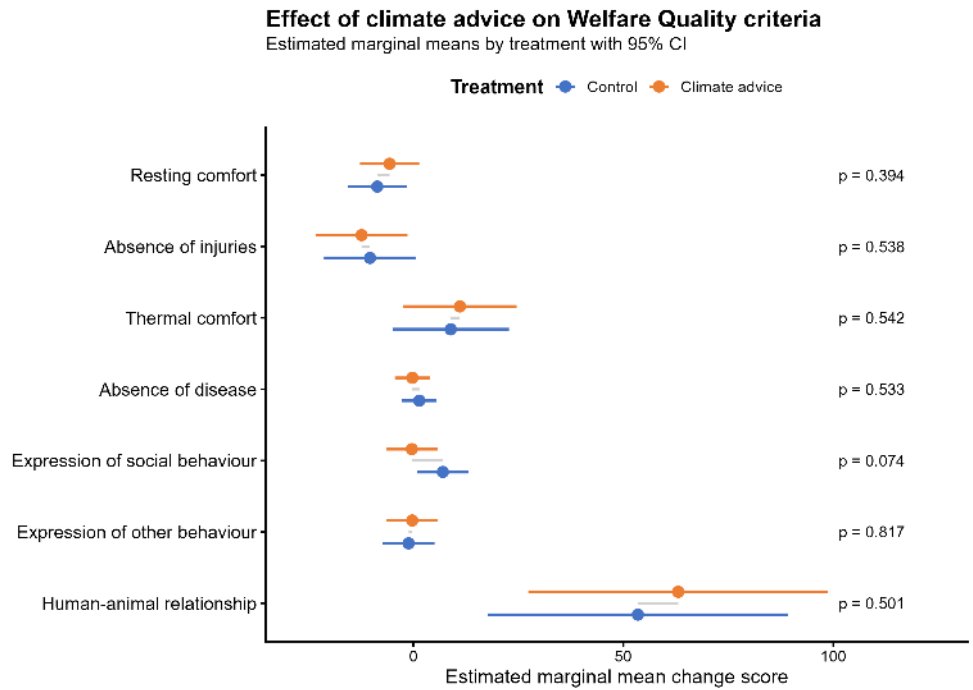
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No apparent effect of Climate Advice on Aggregated Welfare Quality® Criteria

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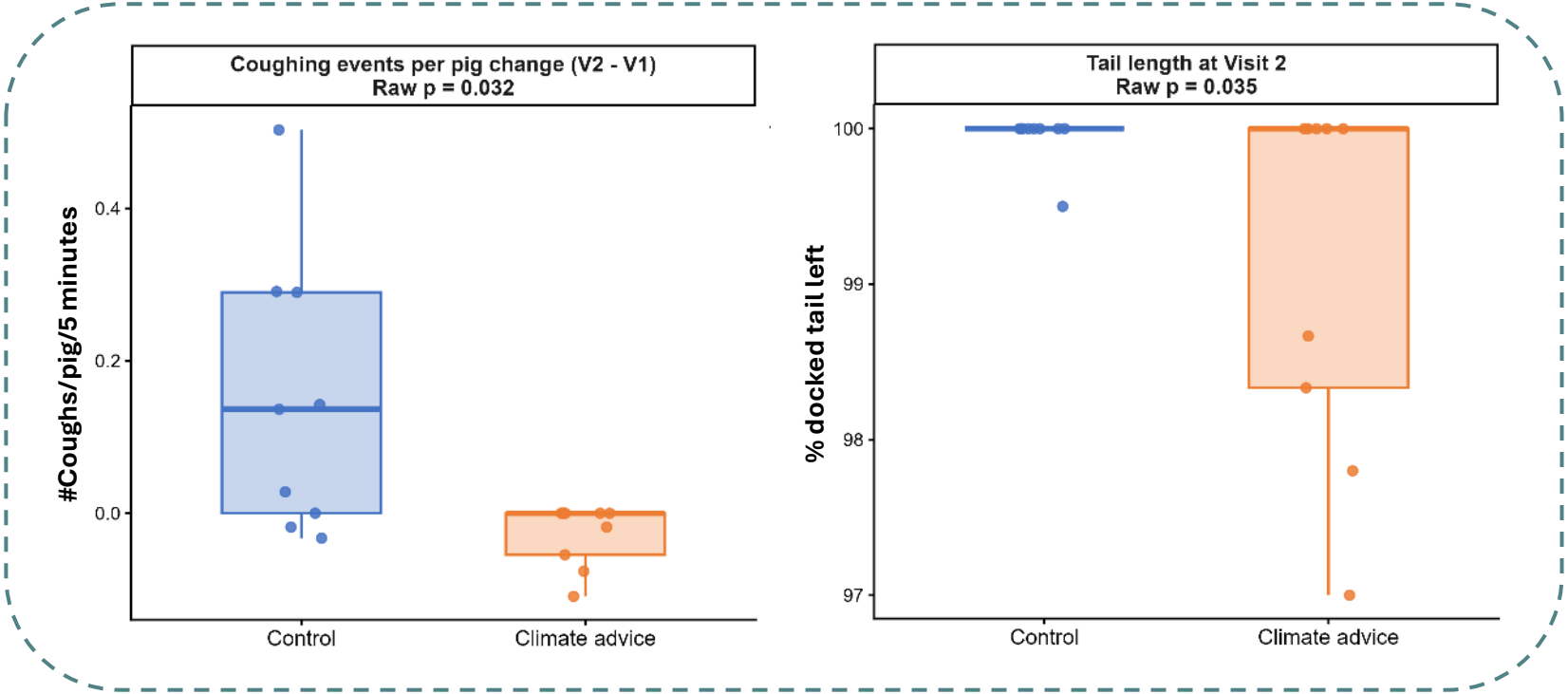


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Effect found on coughing and tail length

(van Langeveld et al., in prep)

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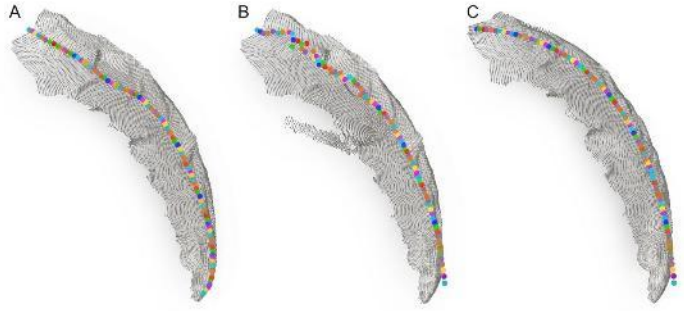
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Assessment of tail length and tail lesions

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- **Within aWISH, several methods have been tested and validated to assess tail length and/or tail lesions in pigs**

- **Long (undocked) and intact tail important iceberg indicator for pig welfare**



Different methods tested for assessment of tail length in Austria (Pfeiffer et al., submitted)

Model	Training	Validation
Necrosis	2720	681
Stump	2590	647
Tail length	5073	1302

Detection of tail necrosis, tail stumps and tail length in Spain (Ramon et al., submitted)

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Conclusions

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- Validation of sensor technologies is essential
- Automatic monitoring of welfare indicators holds great promise
  - Able to monitor all animals slaughtered
- Only information on welfare indicators visible on the animal / carcass
- Need to combine slaughter data with records from farm/catching/transport: challenging

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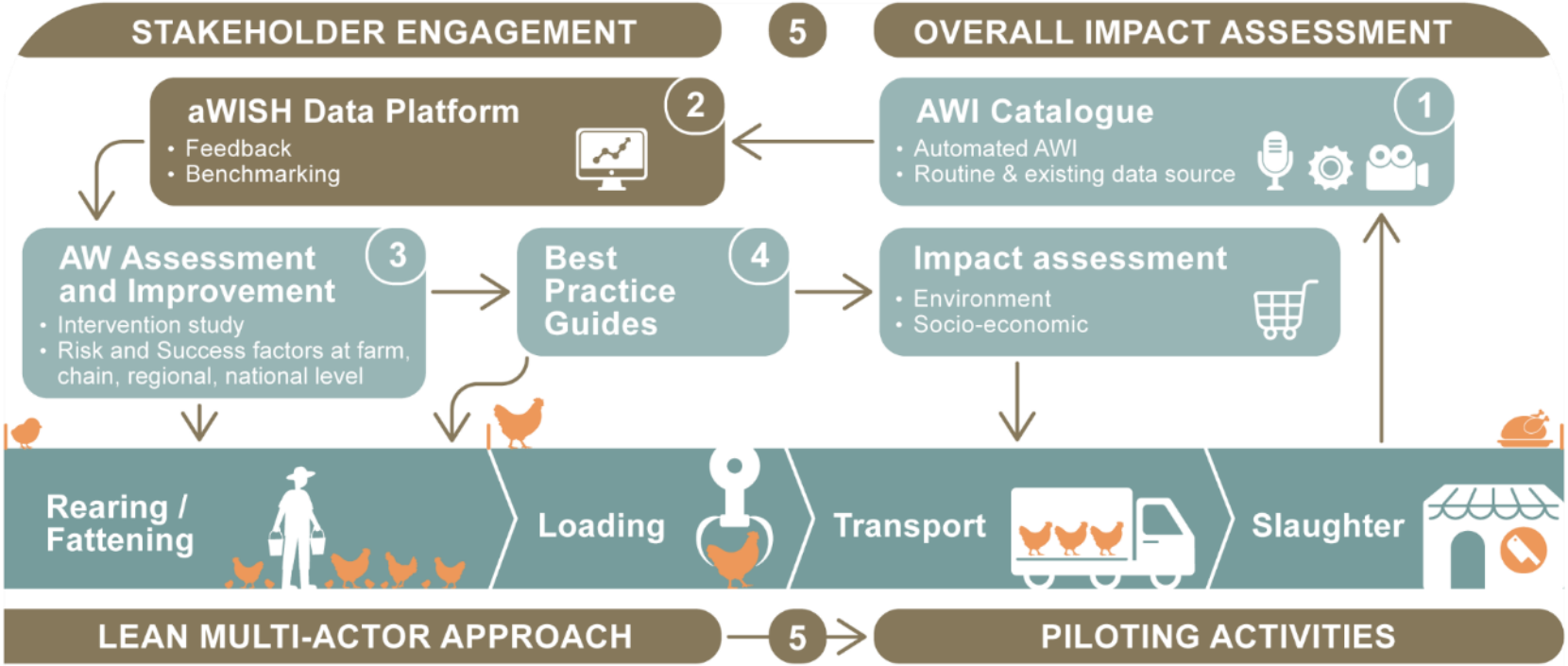
Data platform and data-driven welfare monitoring

Kostas Perakis (Ubitech)

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The Fragmented Data Challenge

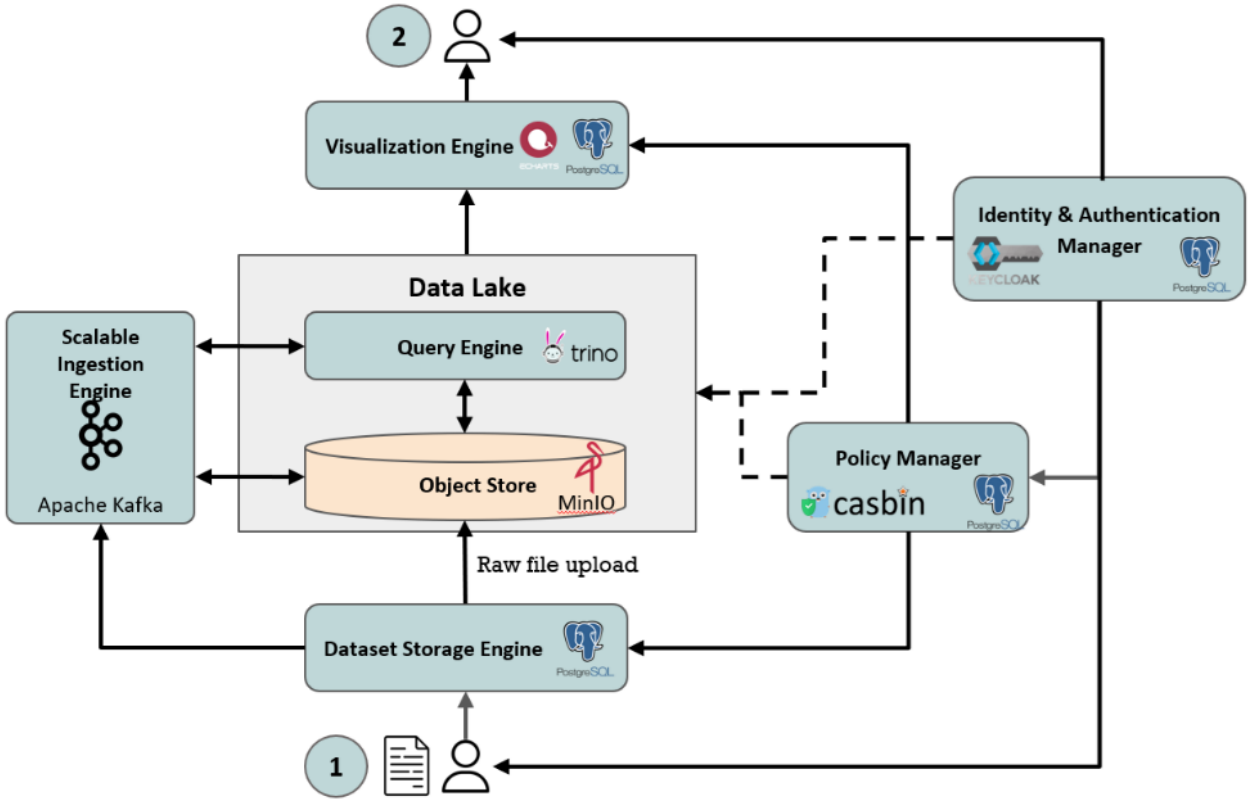
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The aWISH Integrated Data Platform

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Nested Organization & User Management

Data & Metadata Management



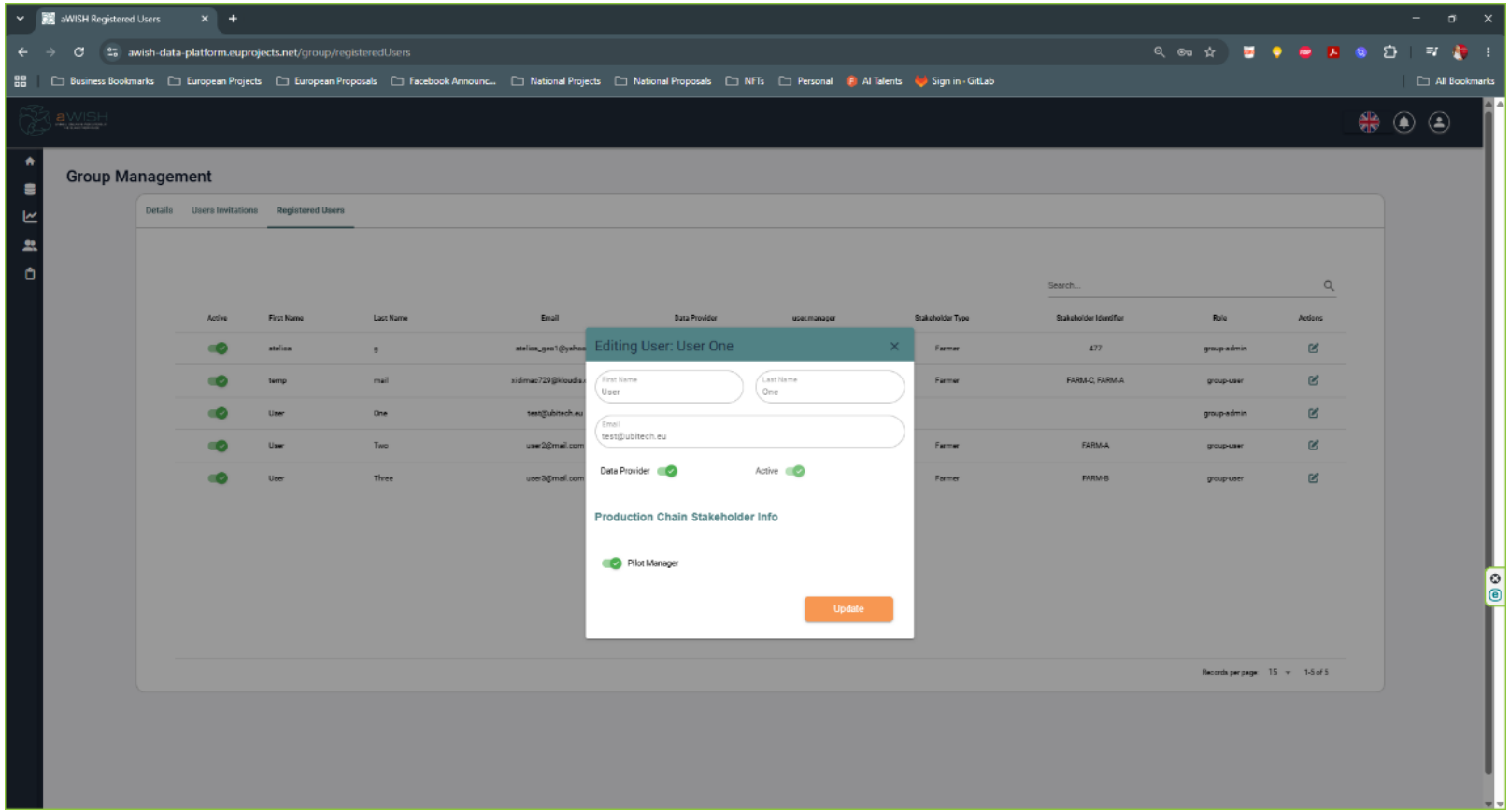
Personalised Visualizations & Dashboards

Fine-Grained Access Policy Management

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The aWISH Integrated Data Platform

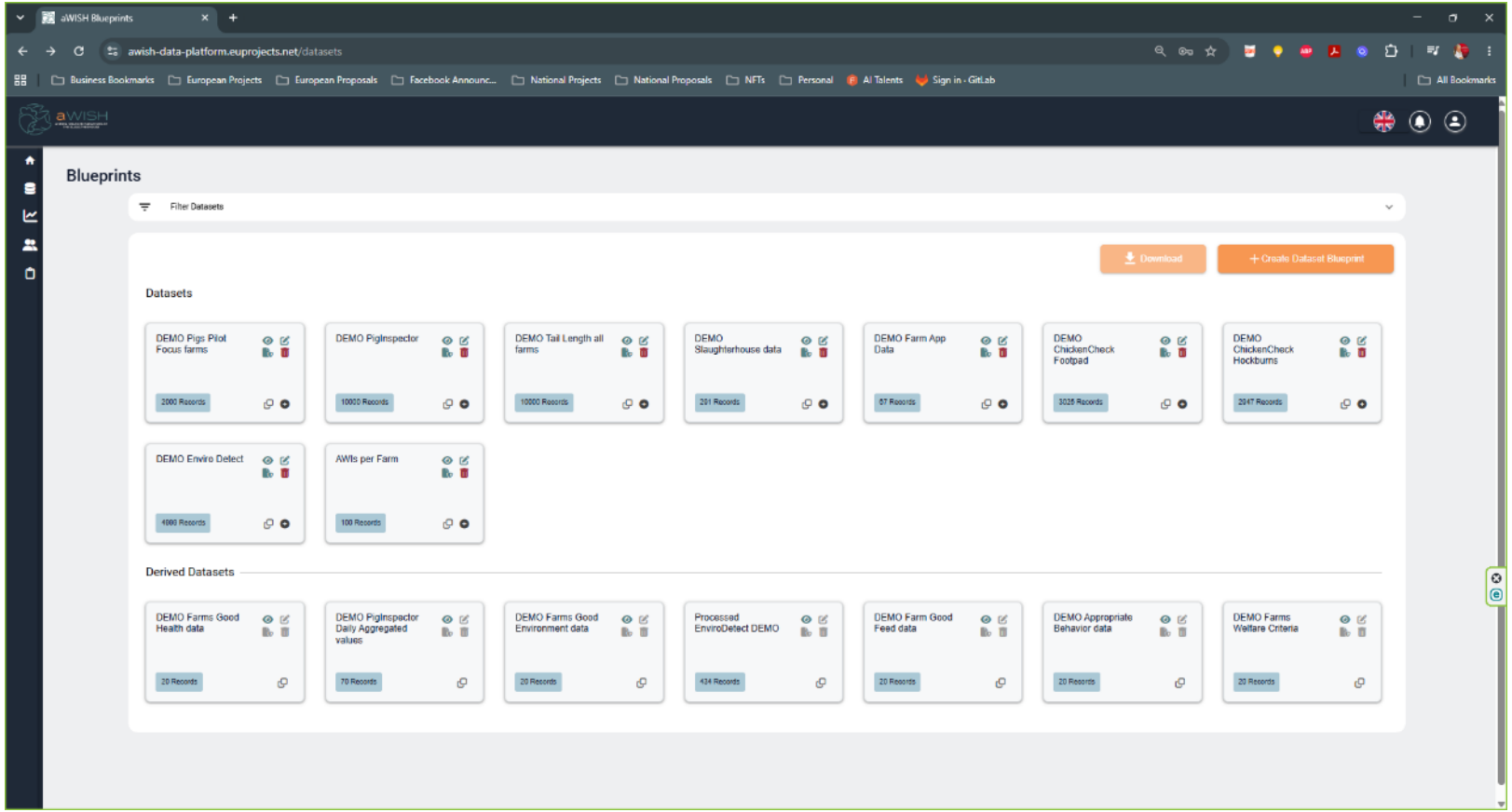
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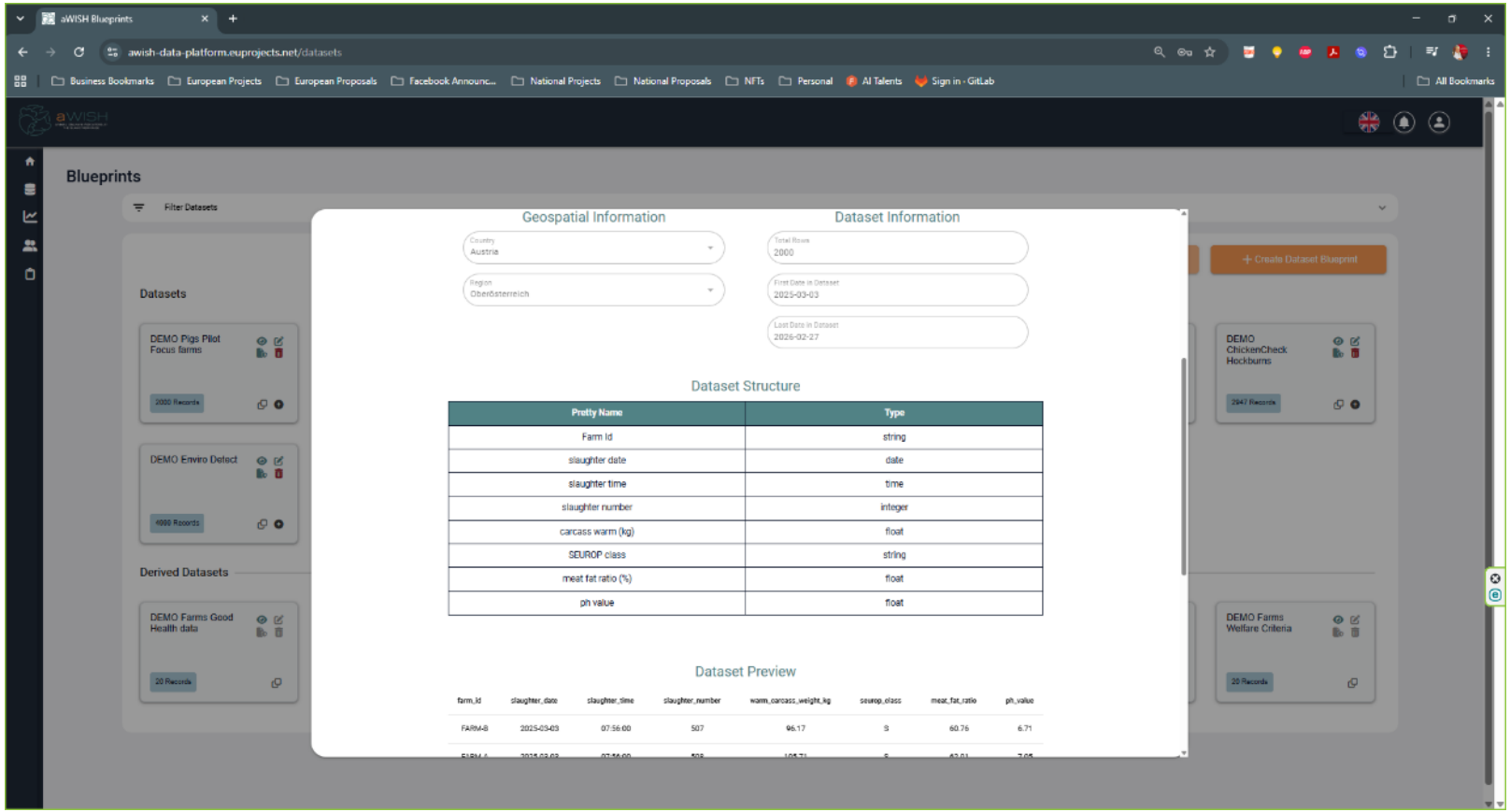
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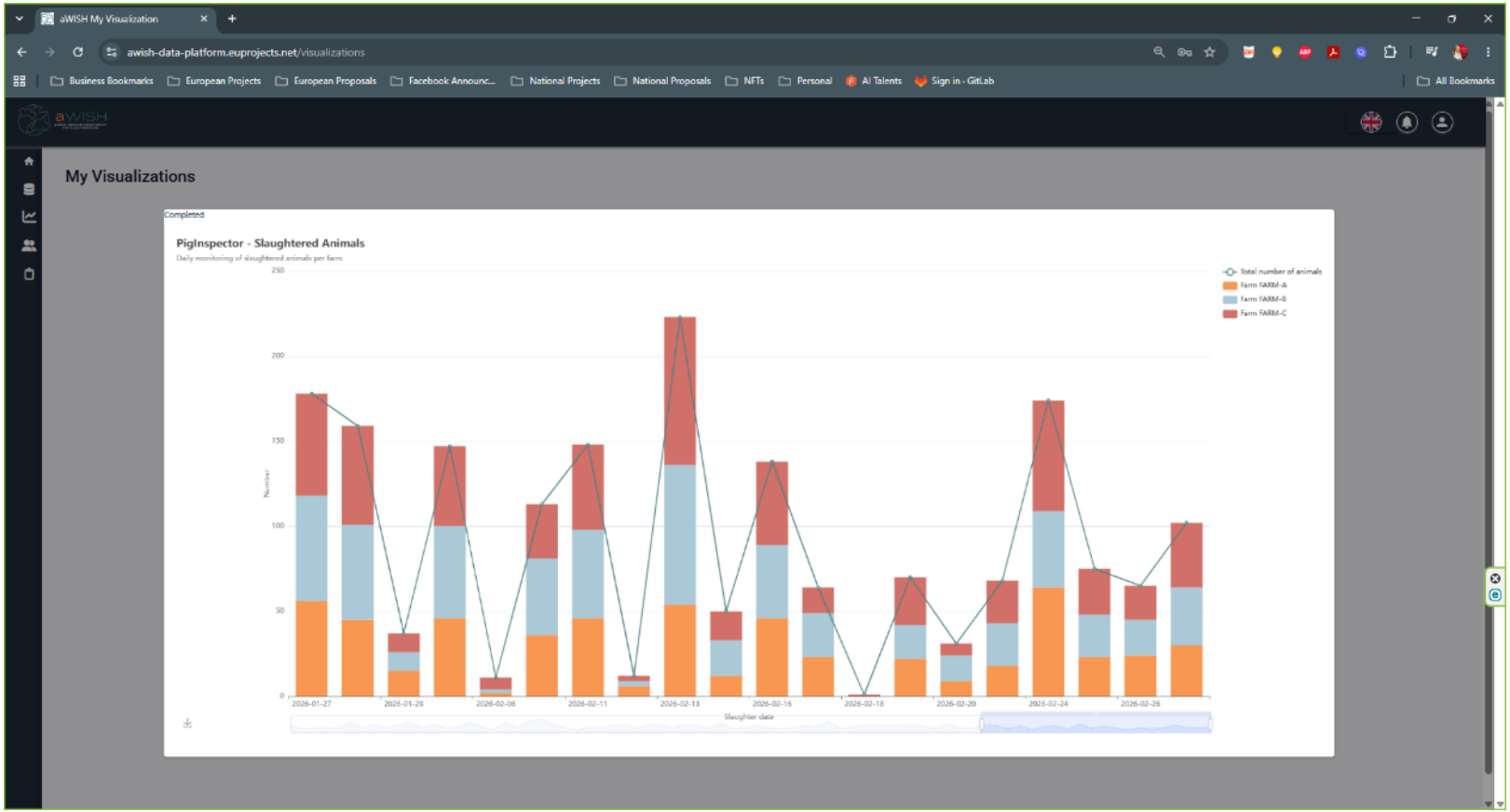
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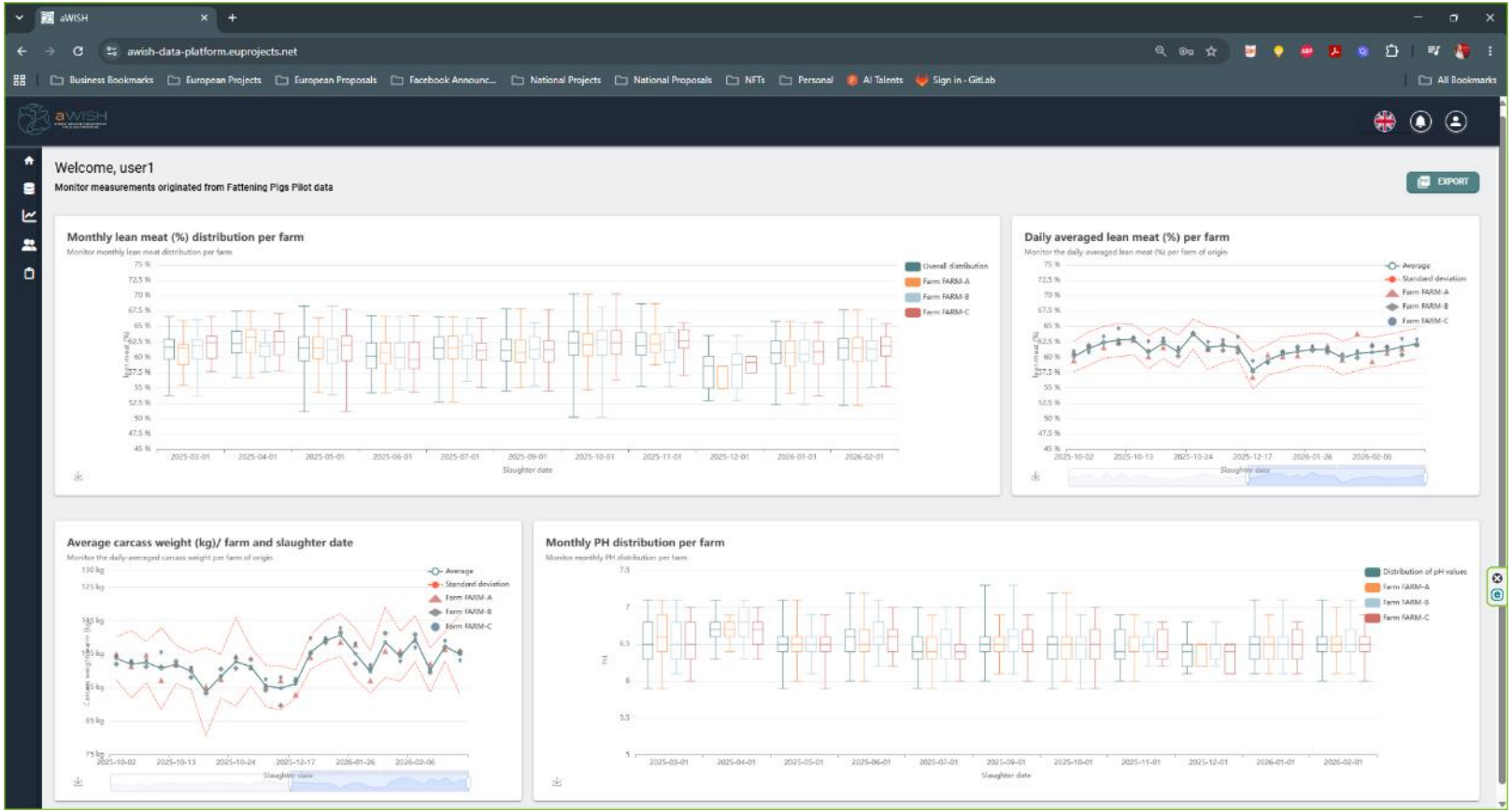
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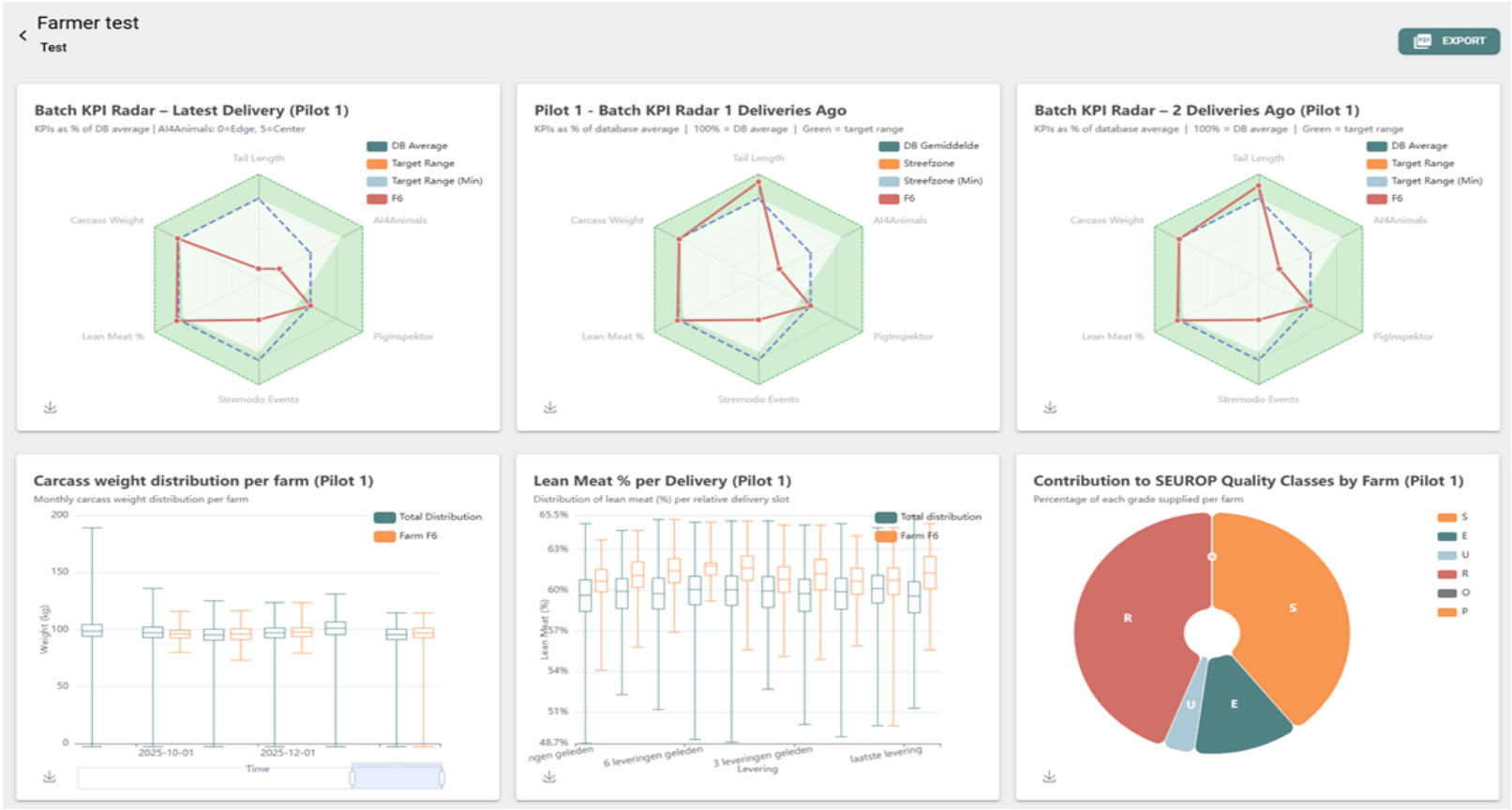
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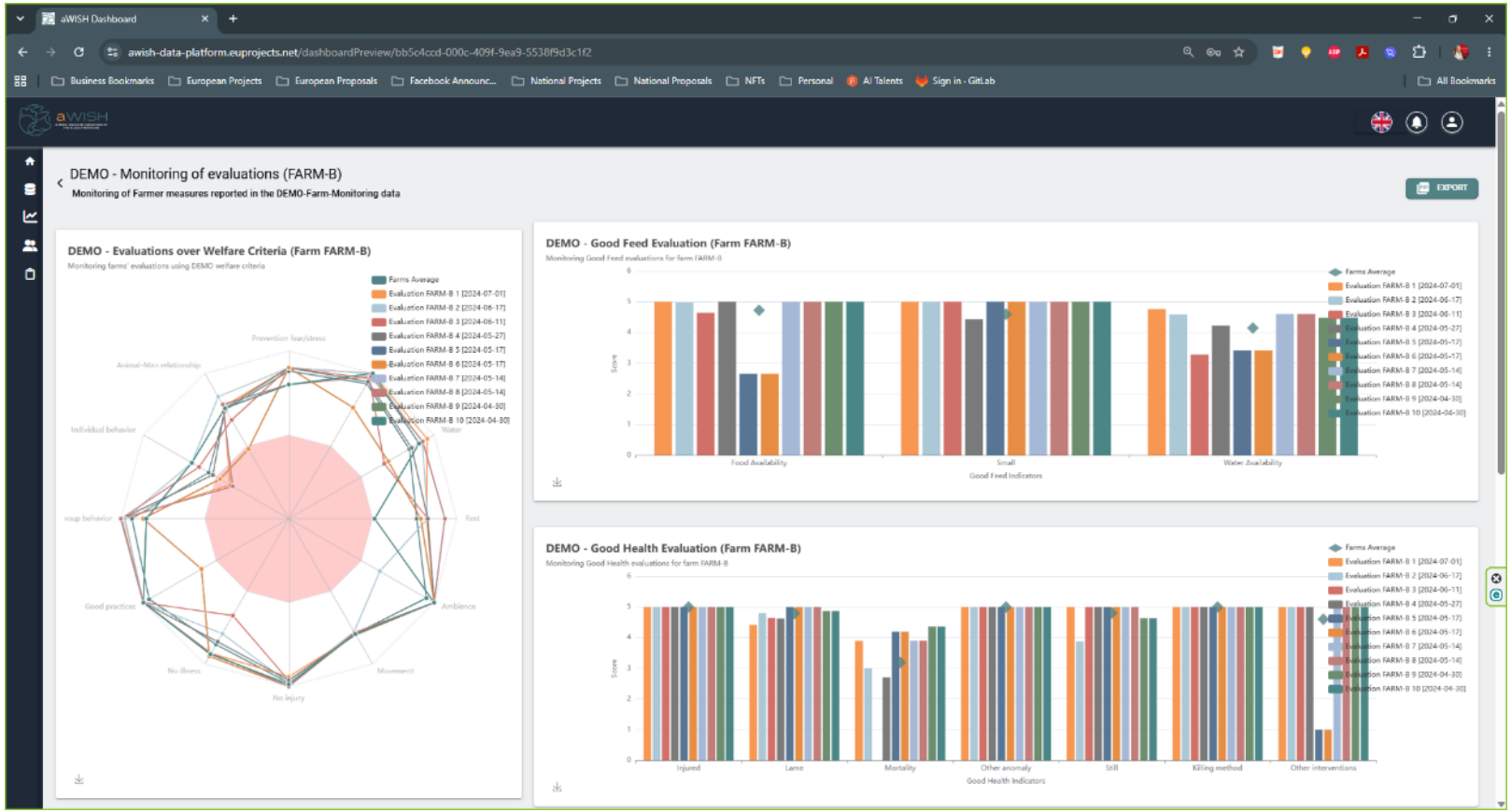
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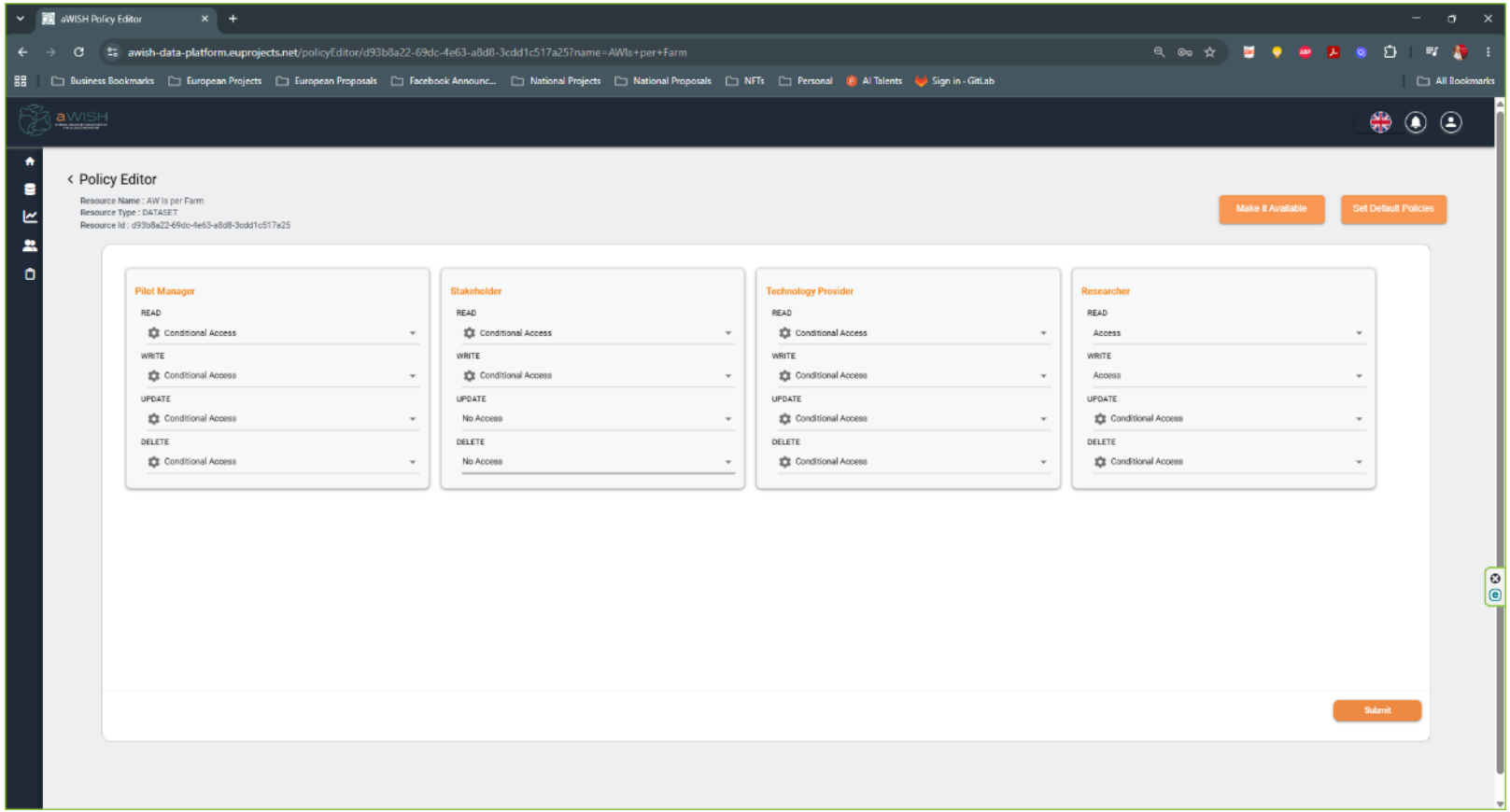
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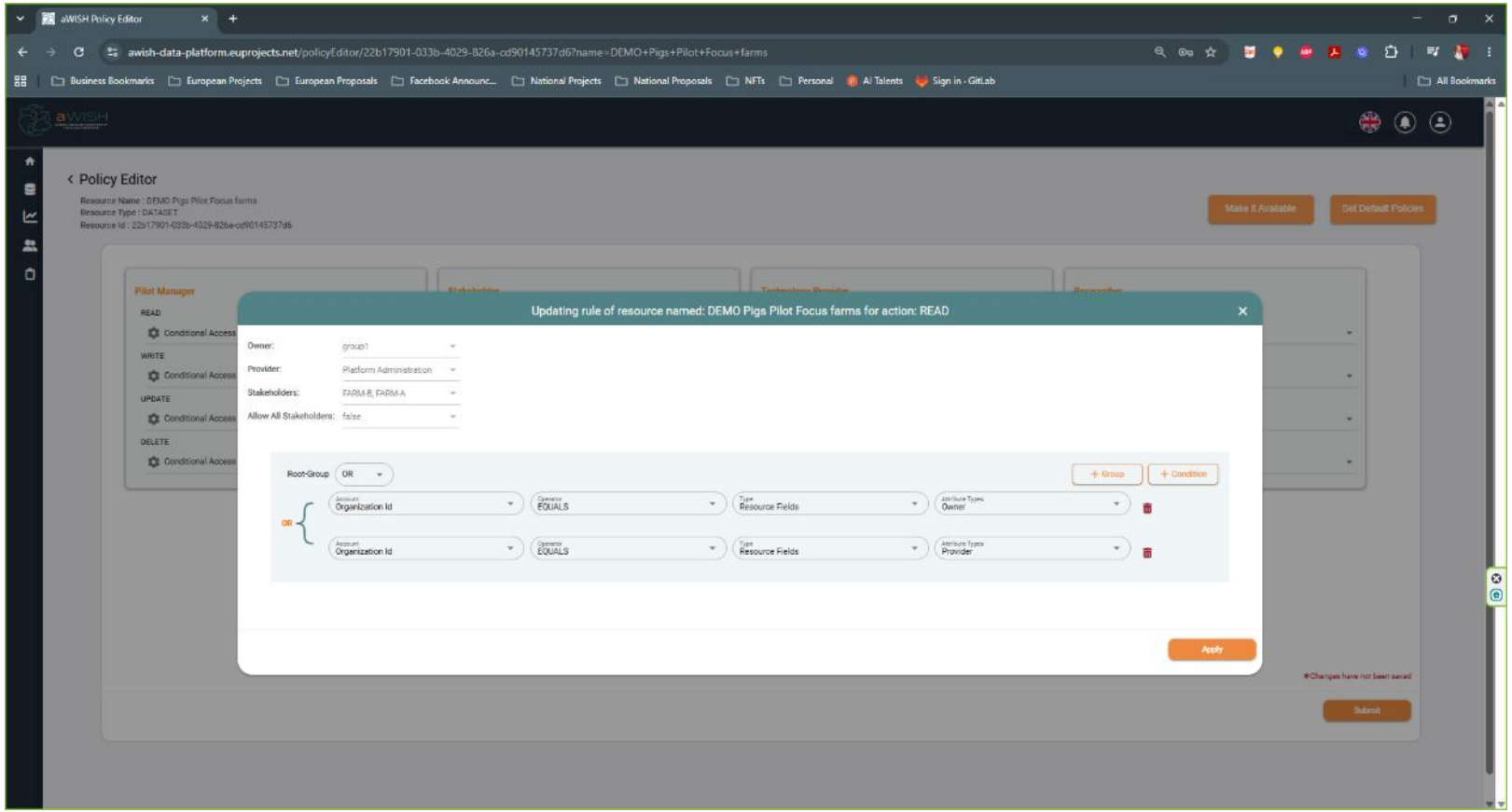
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Best Practice Guides

Multilingual Content



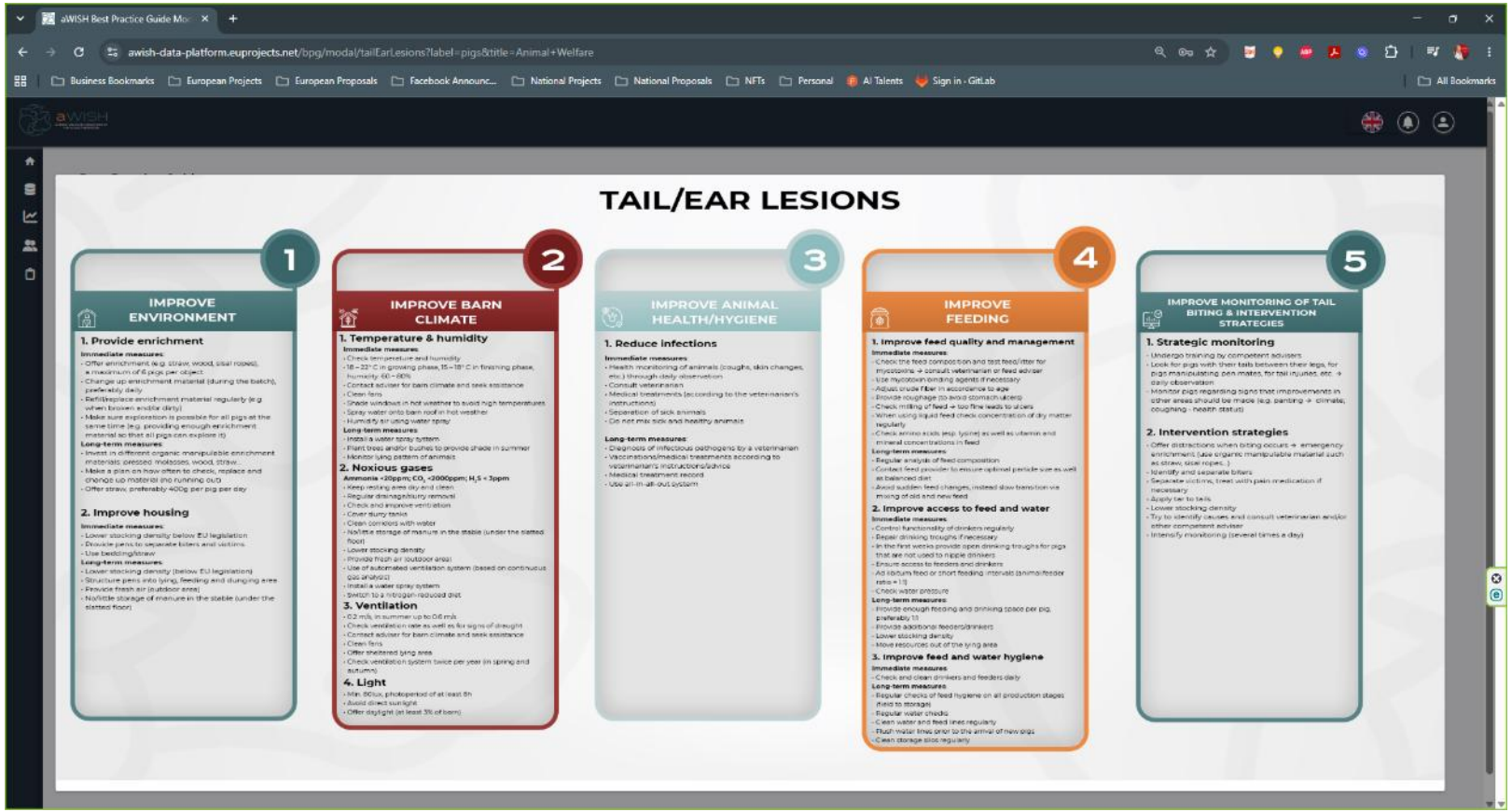
Personal Profile Management

Notifications & Warnings

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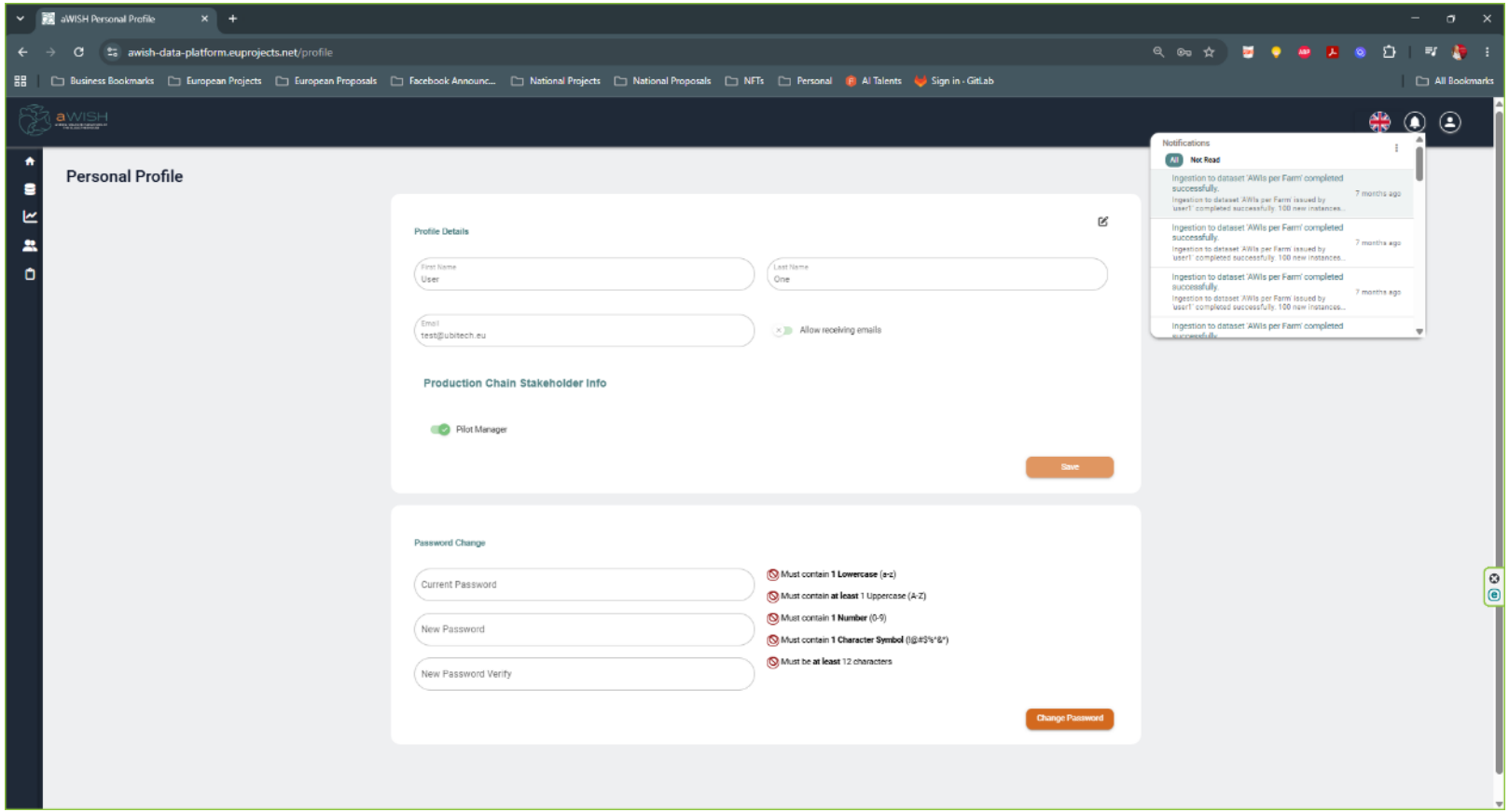
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aWISH Project available at: https://www.awish-project.eu/



aWISH Data Platform available at:

https://awish-data-platform.euprojects.net/signin

aWISH Data Platform Video available at:

https://www.youtube.com/watch?v=o270HtDj9Dk

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(Data) Pain Points

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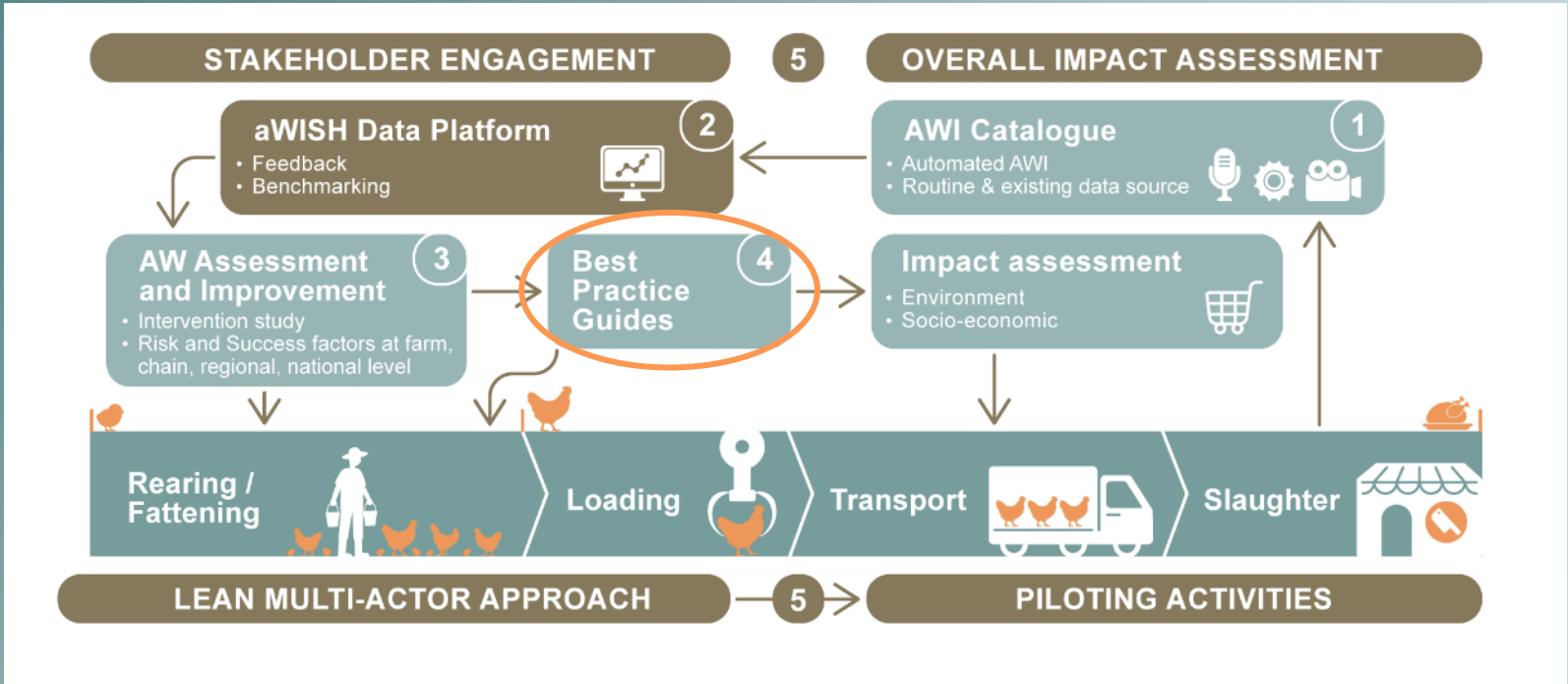
Best Practice Guides: From monitoring to management

Maite Jachens

Institute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour,
University of Veterinary Medicine Hannover, Foundation (TiHo)

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Overview aWISH project



Indicators → Best Practice Guides

PIGINSPECTOR

Measures ear, tail, and skin lesions + tail length.

The sensor is placed above the pen.

CLK GmbH
Bildverarbeitung & Robotik





Detail of the head

Detail of the tail





Detail of the back

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Indicators → Best Practice Guides



Source: Deutscher Schweine-Boniturschlüssel (DSBS) (2017)

Next step??



From Monitoring to Management



Interpreting Data → Appropriate actions

Access to Best Practice Guides

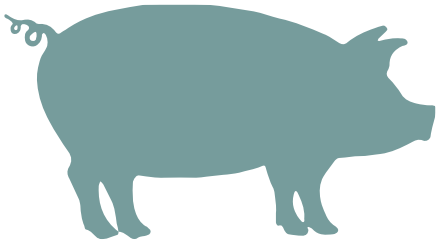
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aWISH Best Practice Guides

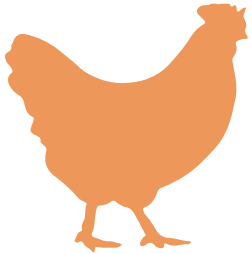
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Recommendations to improve pig and broiler welfare on farm, during transport and at the slaughterhouse

- Two versions:
  - Practical summaries incl. infographics
  - Extensive guides
- 9 guides in total:



4 on pigs



4 on broilers



1 on automated monitoring & giving feedback

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aWISH Best Practice Guides: Practical summaries

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- **Available as guides and infographics**
- **Translated into the 9 project languages (DE, PL, ES, PT, DA, FR, SR, NL, EN)**

www.awish-project.eu/best-practice-guides

PIG → 2 BPGs related to rearing

- **1. Animal Welfare/ Behaviour**
  - 1.1 Tail/Ear lesions
  - 1.2 Skin lesions
- **2. Animal Health**
  - 2.1 Lung lesions
  - 2.2 Bursitis
  - 2.3 Liver lesions

PIG → 2 BPGs related to transport and slaughter

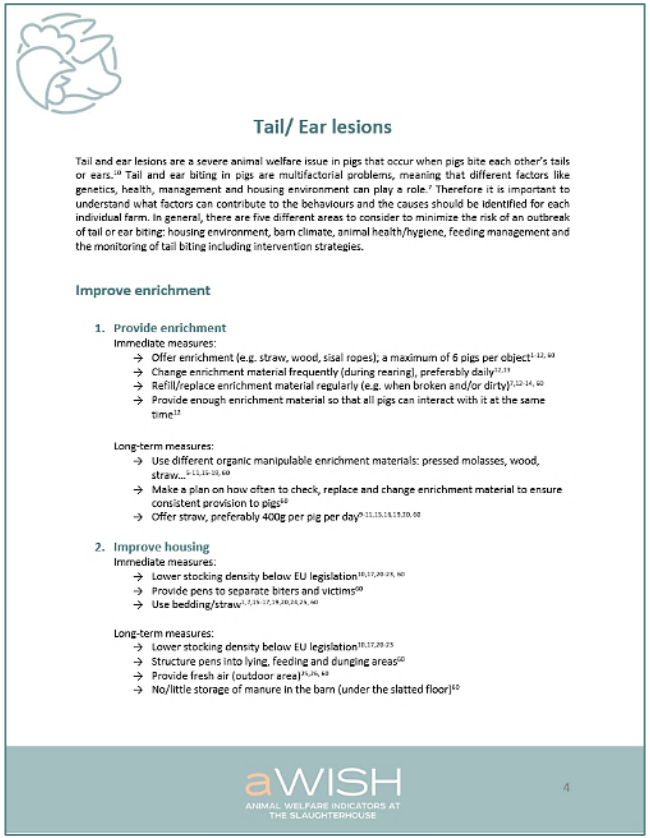
- **1. Transport**
- **2. Slaughter**
  - 2.1 Unloading/Lairage
  - 2.2 Stunning/Bleeding

BROILER → 2 BPGs related to rearing

- **1. Animal Welfare**
  - 1.1 Footpad Dermatitis/ Hock burns
  - 1.2 Heat stress
- **2. Animal Health**
  - 2.1 Lameness

BROILER → 2 BPGs related to loading and transport

- **1. Catching/Loading**
  - 1.1 Catching damage
- **2. Transport & Lairage**
  - 2.1 Dead on arrival



Tail/ Ear lesions

Tail and ear lesions are a severe animal welfare issue in pigs that occur when pigs bite each other's tails or ears.[10] Tail and ear biting in pigs are multifactorial problems, meaning that different factors like genetics, health, management and housing environment can play a role.[7] Therefore it is important to understand what factors can contribute to the behaviours and the causes should be identified for each individual farm. In general, there are five different areas to consider to minimize the risk of an outbreak of tail or ear biting: housing environment, barn climate, animal health/hygiene, feeding management and the monitoring of tail biting including intervention strategies.

Improve enrichment

1. Provide enrichment

Immediate measures:
- → Offer enrichment (e.g. straw, wood, sisal ropes); a maximum of 6 pigs per object[1-12, 60]
- → Change enrichment material frequently (during rearing), preferably daily[7,11]
- → Refill/replace enrichment material regularly (e.g. when broken and/or dirty)[7,12-14, 60]
- → Provide enough enrichment material so that all pigs can interact with it at the same time[12]

Long-term measures:
- → Use different organic manipulable enrichment materials: pressed molasses, wood, straw...[1-11,15-18,60]
- → Make a plan on how often to check, replace and change enrichment material to ensure consistent provision to pigs[60]
- → Offer straw, preferably 400g per pig per day[5-11,15,16,19,20,60]

2. Improve housing

Immediate measures:
- → Lower stocking density below EU legislation[10,17,20-25, 60]
- → Provide pens to separate biters and victims[60]
- → Use bedding/straw[1,7,15-17,19,20,22,24, 60]

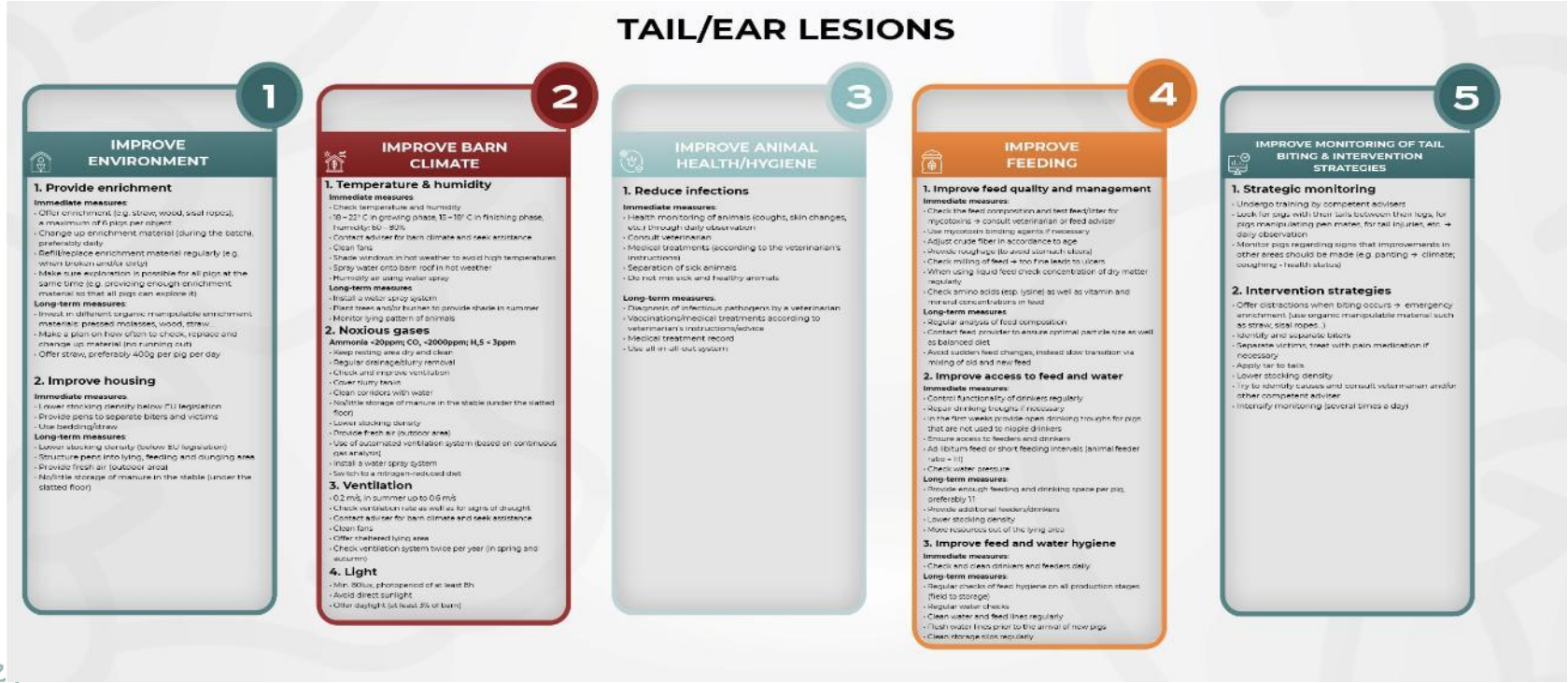
Long-term measures:
- → Lower stocking density below EU legislation[10,17,20-25]
- → Structure pens into lying, feeding and dunging areas[60]
- → Provide fresh air (outdoor area)[25,26, 60]
- → No/little storage of manure in the barn (under the slatted floor)[10]

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4

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aWISH Best Practice Guides: Infographics

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Examples of Best Practices recommended for tail lesions in pigs

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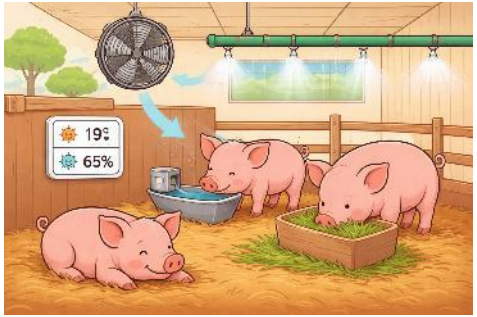
Enrichment



AI-generated image with OpenAI ChatGPT (DALL·E), 2026

- Change enrichment material frequently
- Replace when broken and/or dirty
- Offer straw

Barn climate



AI-generated image with OpenAI ChatGPT (DALL·E), 2026

- Monitor: noxious gases, temperature, humidity & ventilation
- Install a waterspray system
- Provide fresh air (outdoor areas)

Feeding



AI-generated image with OpenAI ChatGPT (DALL·E), 2026

- Provide roughage
- Check aminoacids
- Provide enough feeding and drinking space, preferably 1:1
- Clean water and feed lines regularly

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aWISH Best Practice Guides: Extensive guides

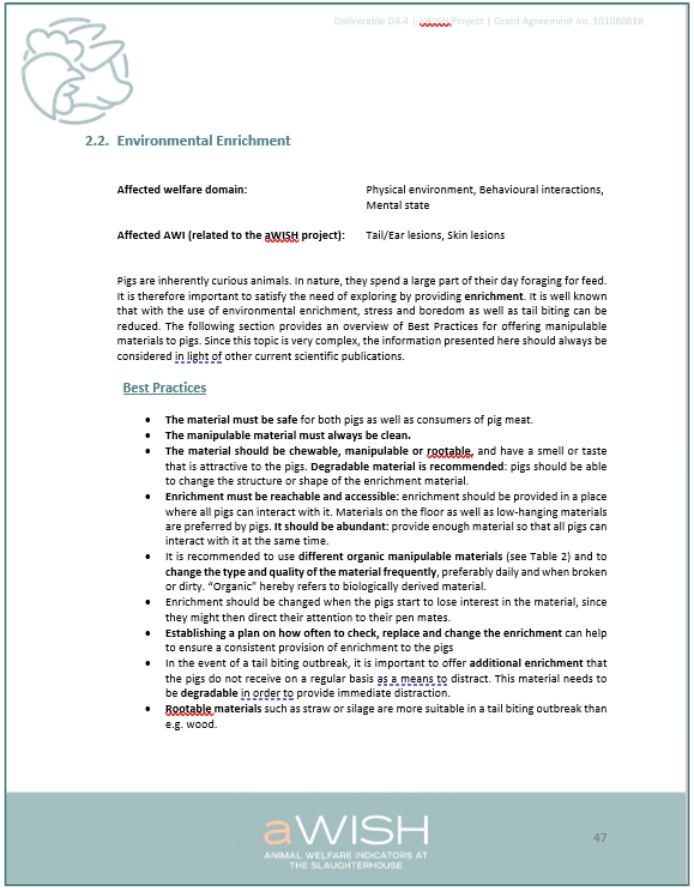
- More extensive guides (e.g. for advisors, policy makers)
- Not yet available, but will be uploaded soon!

PIG → 2 BPGs related to rearing
- 1. Good Environment
- 2. Good Health

PIG → 2 BPGs related to transport and slaughter
- 1. Transport
- 2. Slaughter

BROILER → 2 BPGs related to rearing
- 1. Good Environment
- 2. Good Health

BROILER → 2 BPGs related to loading and transport
- 1. Catching & Loading
- 2. Transport & Slaughter



Deliverable D4.4 | aWISH Project | Grant Agreement no. 101060818

2.2. Environmental Enrichment

Affected welfare domain: Physical environment, Behavioural interactions, Mental state

Affected AWI (related to the aWISH project): Tail/Ear lesions, Skin lesions

Pigs are inherently curious animals. In nature, they spend a large part of their day foraging for feed. It is therefore important to satisfy the need of exploring by providing **enrichment**. It is well known that with the use of environmental enrichment, stress and boredom as well as tail biting can be reduced. The following section provides an overview of Best Practices for offering manipulable materials to pigs. Since this topic is very complex, the information presented here should always be considered in light of other current scientific publications.

Best Practices

- **The material must be safe** for both pigs as well as consumers of pig meat.
- **The manipulable material must always be clean.**
- **The material should be chewable, manipulable or rootable**, and have a smell or taste that is attractive to the pigs. **Degradable material is recommended**: pigs should be able to change the structure or shape of the enrichment material.
- **Enrichment must be reachable and accessible:** enrichment should be provided in a place where all pigs can interact with it. Materials on the floor as well as low-hanging materials are preferred by pigs. **It should be abundant:** provide enough material so that all pigs can interact with it at the same time.
- It is recommended to use **different organic manipulable materials** (see Table 2) and to **change the type and quality of the material frequently**, preferably daily and when broken or dirty. "Organic" hereby refers to biologically derived material.
- Enrichment should be changed when the pigs start to lose interest in the material, since they might then direct their attention to their pen mates.
- **Establishing a plan on how often to check, replace and change the enrichment** can help to ensure a consistent provision of enrichment to the pigs
- In the event of a tail biting outbreak, it is important to offer **additional enrichment** that the pigs do not receive on a regular basis as a means to distract. This material needs to be **degradable** in order to provide immediate distraction.
- Rootable **materials** such as straw or silage are more suitable in a tail biting outbreak than e.g. wood.

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ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE
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aWISH Best Practice Guides: Automated monitoring

- Recommendations for the development, installation and application of new technologies that can monitor animal welfare of pigs and broilers
- Best Practices for providing feedback to relevant stakeholders
- Includes:
  - Factual backgrounds
  - Challenges
  - Best Practices
  - Information on aWISH technologies
  - aWISH data platform user manual
- Not yet available, but will be uploaded soon!

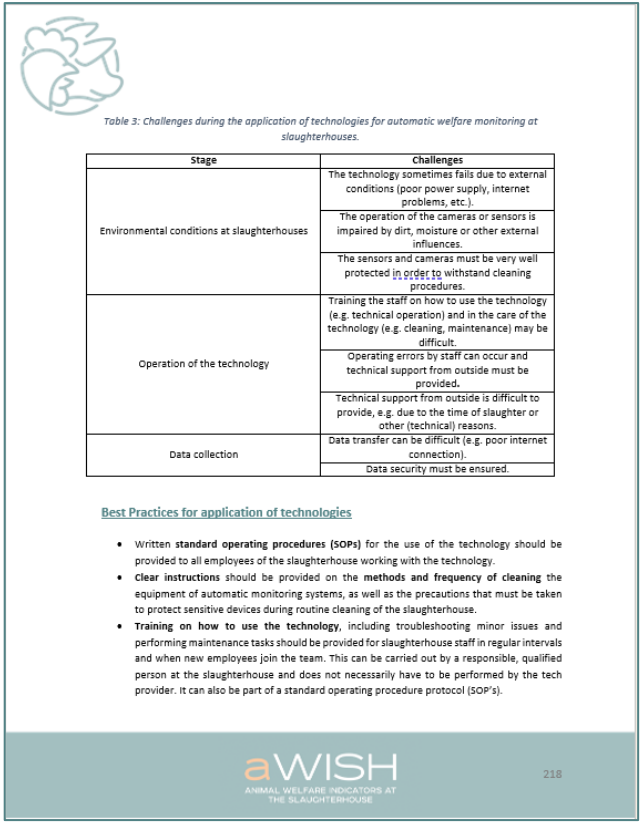


Table 3: Challenges during the application of technologies for automatic welfare monitoring at slaughterhouses.

Stage	Challenges
Environmental conditions at slaughterhouses	The technology sometimes fails due to external conditions (poor power supply, internet problems, etc.).
	The operation of the cameras or sensors is impaired by dirt, moisture or other external influences.
	The sensors and cameras must be very well protected in order to withstand cleaning procedures.
Operation of the technology	Training the staff on how to use the technology (e.g. technical operation) and in the care of the technology (e.g. cleaning, maintenance) may be difficult.
	Operating errors by staff can occur and technical support from outside must be provided.
	Technical support from outside is difficult to provide, e.g. due to the time of slaughter or other (technical) reasons.
Data collection	Data transfer can be difficult (e.g. poor internet connection).
	Data security must be ensured.

Best Practices for application of technologies

- Written **standard operating procedures (SOPs)** for the use of the technology should be provided to all employees of the slaughterhouse working with the technology.
- **Clear instructions** should be provided on the **methods and frequency of cleaning** the equipment of automatic monitoring systems, as well as the precautions that must be taken to protect sensitive devices during routine cleaning of the slaughterhouse.
- **Training on how to use the technology**, including troubleshooting minor issues and performing maintenance tasks should be provided for slaughterhouse staff in regular intervals and when new employees join the team. This can be carried out by a responsible, qualified person at the slaughterhouse and does not necessarily have to be performed by the tech provider. It can also be part of a standard operating procedure protocol (SOP's).

aWISH ANIMAL WELFARE INDICATORS AT THE SLAUGHTERHOUSE 218

Why Best Practice Guides?

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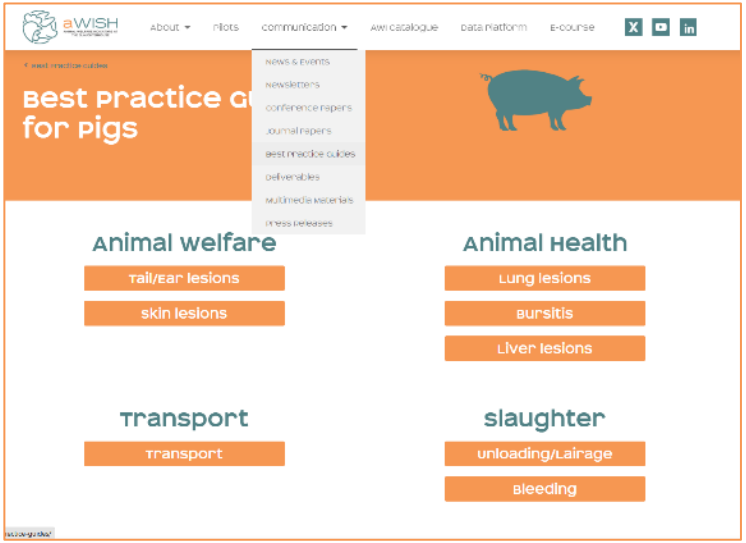
- Step from data to practical guidance
- Compact collection of animal welfare improving recommendations

Good PLF does not stop at measurement — it supports better decisions, better practices, and better animal welfare.



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Best Practice Guides





www.awish-project.eu/best-practice-guides

www.youtube.com/@HEurope_aWISH

Thank you for your attention! Questions?



maite.marie.jachens@tiho-hannover.de



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

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awish-project.eu

awish@ilvo.vlaanderen.be

Socio-economic implications

Mavis Boimah (Thünen)

Funded by the European Union

Weight-Detect (WD) Sensor

Funded by the European Union

The WD camera installed on a commercial pig farm



Banhazi et al. (2024)

Objective:

- evaluate the applicability of the technology
- use information from the sensor to assess the overall welfare status of the pigs

The data processing and communication unit of the WD system before deployment



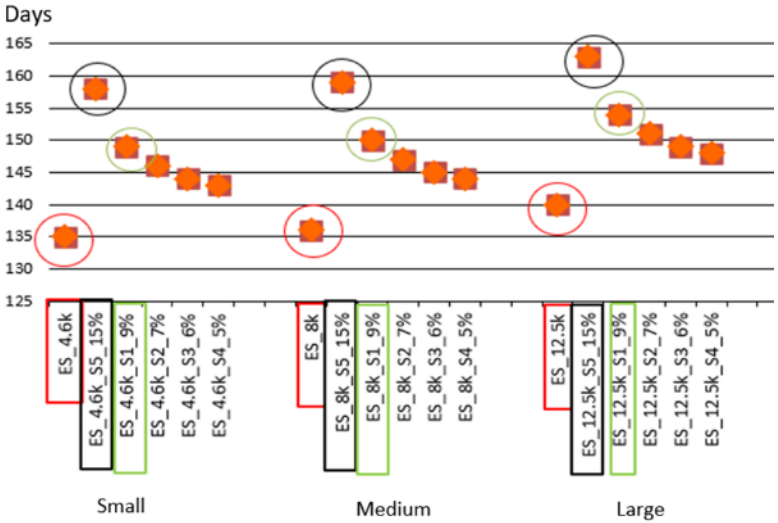
Banhazi et al. (2024)

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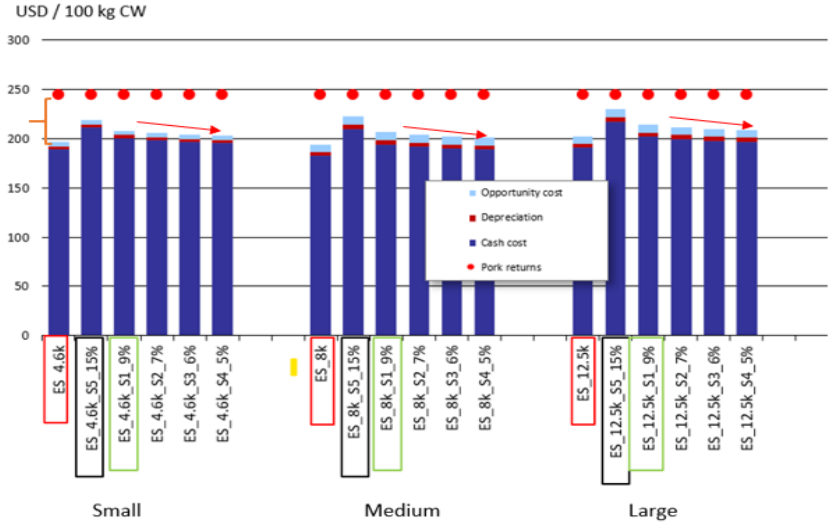
Main Findings

Funded by
the European Union

Comparison of finishing period



Comparison of profits



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ChickenCheck Footpad System

Funded by the European Union

- Merged data collected from the pilot farms and data from the ChickenCheck Footpad system (aWish data platform):

✓ analyse the impact of different bedding materials and stocking density on footpad scores

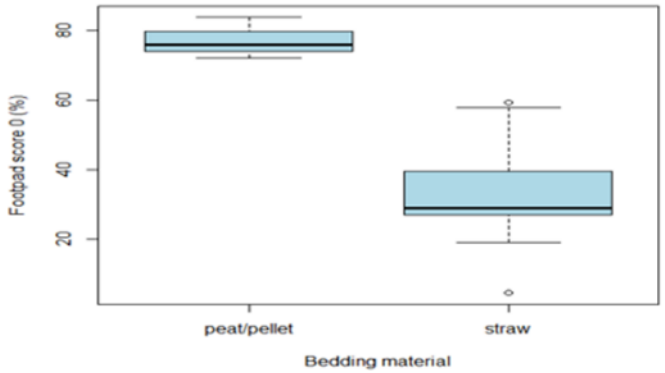


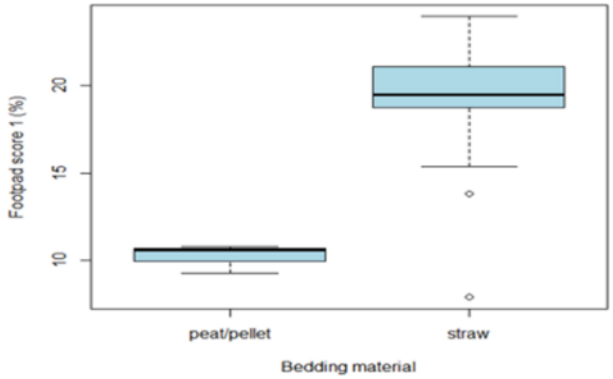
score	interpretation	Description	Welfare assessment
0	Healthy feet	Footpad is completely healthy with no discoloration or damage	Good welfare condition
1	Mild lesion	Small superficial lesion or discoloration; skin mostly intact	Minor welfare concern
2a	Moderate lesion	Clear lesion or ulceration present but not very deep or extensive	Moderate welfare problem
2b	Severe lesion	Large, deep ulcer or necrotic lesion covering a significant part of the footpad	Severe welfare problem

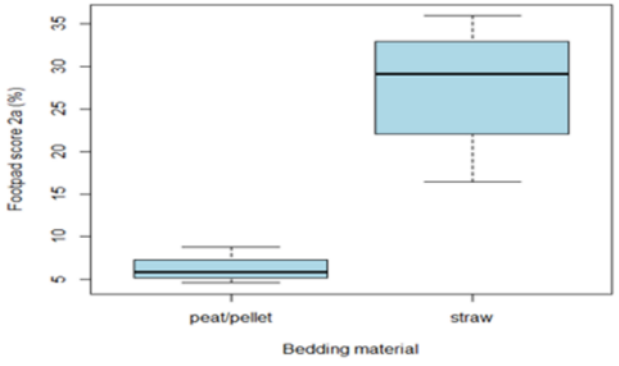
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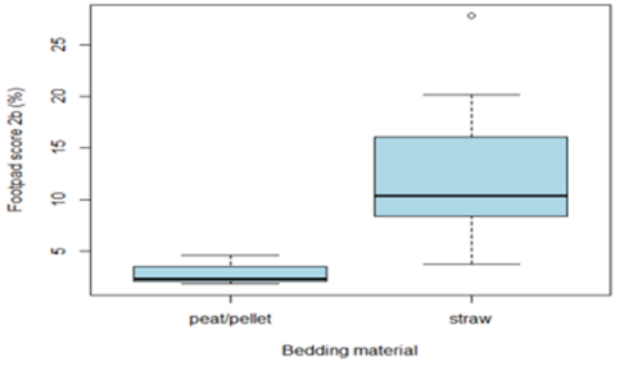
Main Findings: FP scores vs bedding material

Funded by the European Union





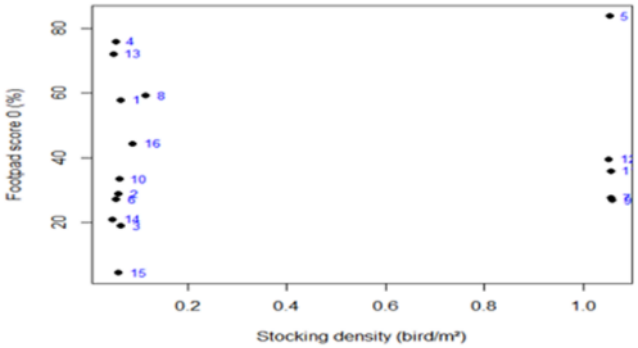


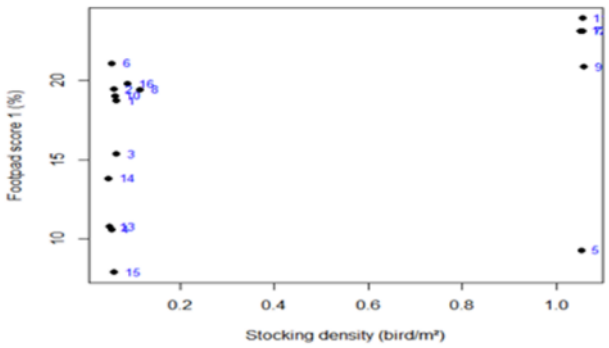


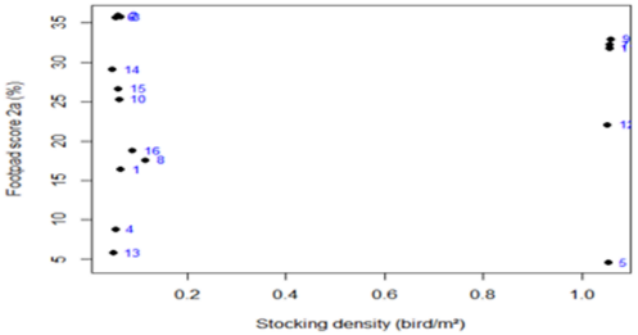
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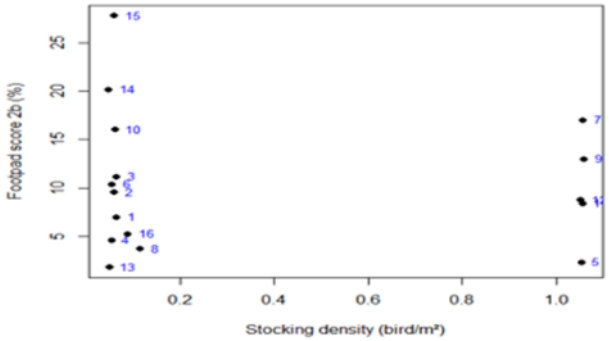
Main Findings: FP scores vs stocking density

Funded by the European Union









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Transport Monitoring: Model for Heat Stress Mitigation

Funded by the European Union

- The consequences of heat stress during transport are substantial; physiological disturbances, carcass downgrading, reduced meat quality, including the development of pale, soft, and exudative (PSE) meat, increased mortality rates (DOA)

- Several practical strategies have been proposed to mitigate heat stress during poultry transport – e.g., improving ventilation, reducing stocking density

Objective:

- This study evaluates the socio-economic (including animal welfare) impacts of different heat stress mitigation strategies during poultry transport to slaughter, using a model developed by ITAVI in France

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Main Findings: Economic

Funded by the European Union

Scenario	Exterior temperature during transport (°C)	Stocking density (kg/m2)	No. of trips	Gross Margin €/bird	Change in GM €/bird	% change in GM
Reference	15	60.98	1	4.629		-
Scenario 1 – high ambient temperature	30	60.98	1	4.604	-0.025	-0.536
Scenario 2 – lower stocking density (-10%)	30	54.95	2	4.593	-0.036	-0.771
Scenario 3 – empty crate at rear bottom	30	60.98	2	4.596	-0.033	-0.719

Although GM declines, the differences are not so significant



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Main Findings: Social

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State of birds during transport	Reference Situation	Scenario 1 - hot condition	Scenario 2 - lower density (-10%)	Scenario 3 - empty crate at rear bottom
Estimated proportion of birds under no stress (%)	100	44.15	75.63	49.68
Estimated proportion of birds under alert (%)	0	49.64	21.61	49.8
Estimated proportion of birds in danger (%)	0	5.37	2.67	0.52
Estimated proportion of birds in a state of emergency (%)	0	0.84	0.09	0
Dead-on-arrival (DOA) rate (%)	**0.18**	**0.71**	**0.64**	**0.60**

Bird welfare as well as DOA rates improve with scenarios 2 &3



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Pilot experiences

11:00 – 11:25

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Pig pilot experiences

Josep Reixach (Batallé)

Funded by the European Union

Sensors implemented at 4 Pig Pilots

Funded by the European Union

At Farm

- Environmental sensors (temperature, humidity, ammonia, CO2) to evaluate the confort of the animals
- Weight estimation sensors

Sensors implemented at 4 Pig Pilots

Funded by the European Union

At Slaughterhouse

- Sound and motion sensors to evaluate objectively behaviour of pigs
- Debleeding quality assessed during exsanguination, complemented by stress-related biomarkers analyzed in blood
- Stunning effectiveness assessed via automatic image collection and AI algorithms
- Automated tear staining assessment implemented to test and validate a novel welfare indicator
- Inline tail-length measurement and/or tail category classification
- PigInspector → whole carcass image analysis, including tail length and lesions
- Automated image analysis for identifying and scoring lung lesions linked to respiratory diseases

Stages in sensor implementation

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1. Installation
2. Adjustment to site specific conditions
3. Training or adjusting algorithms & data collection
4. Validation
5. Data integration in operational processes

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Challenges & Achievements at Pig pilots

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CHALLENGES

- Site-specific tuning and image conditions
- Algorithm training and validation
- IT integration and edge-computing capacity
- Durability under harsh cleaning conditions
- Embedding outputs in operational routines

ACHIEVEMENTS

- Useful objective, repeated data capture
- Potential for continuous welfare assessment
- Indicators available at several chain stages
- Digital feedback opportunities for farmers and plants

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Source: R. Klont, M. Bouwknegt et al. (2026) EAAP communication, Hamburg, Germany

Main Results in Pilot 2_ At Farm

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Enviro-Detect

- **WHAT DOES IT MEASURE?**

On-farm measurement of temperature (indoor and outdoor), relative humidity and concentrations of ammonia and CO_2

Innotech

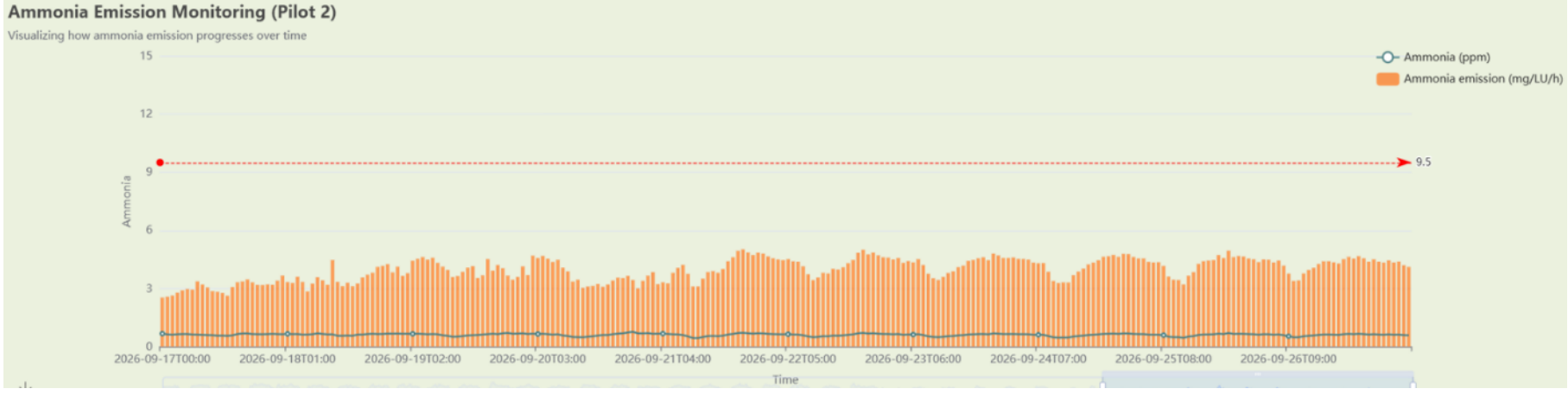


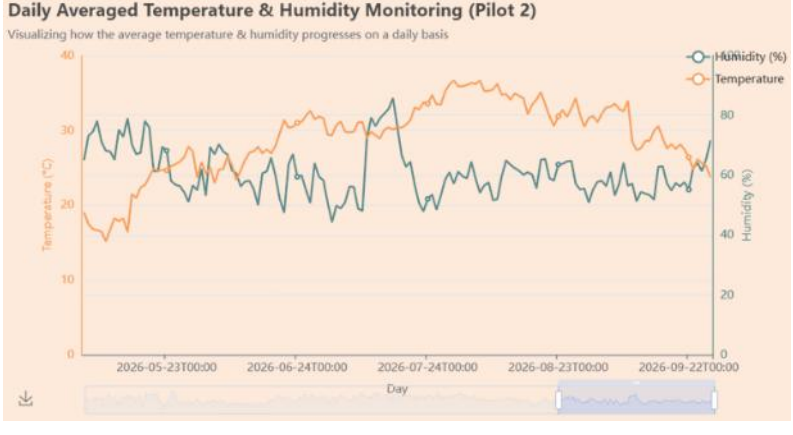


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Main Results in Pilot 2_ At Farm

Funded by the European Union





Source: AWISH Data platform

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Main Results in Pilot 2_ At Farm

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WEIGHT DETECT

- **WHAT DOES IT MEASURE?**

Contactless weighing system for a sample of pigs for a given Farm/barn (sentinel group)



Innotech

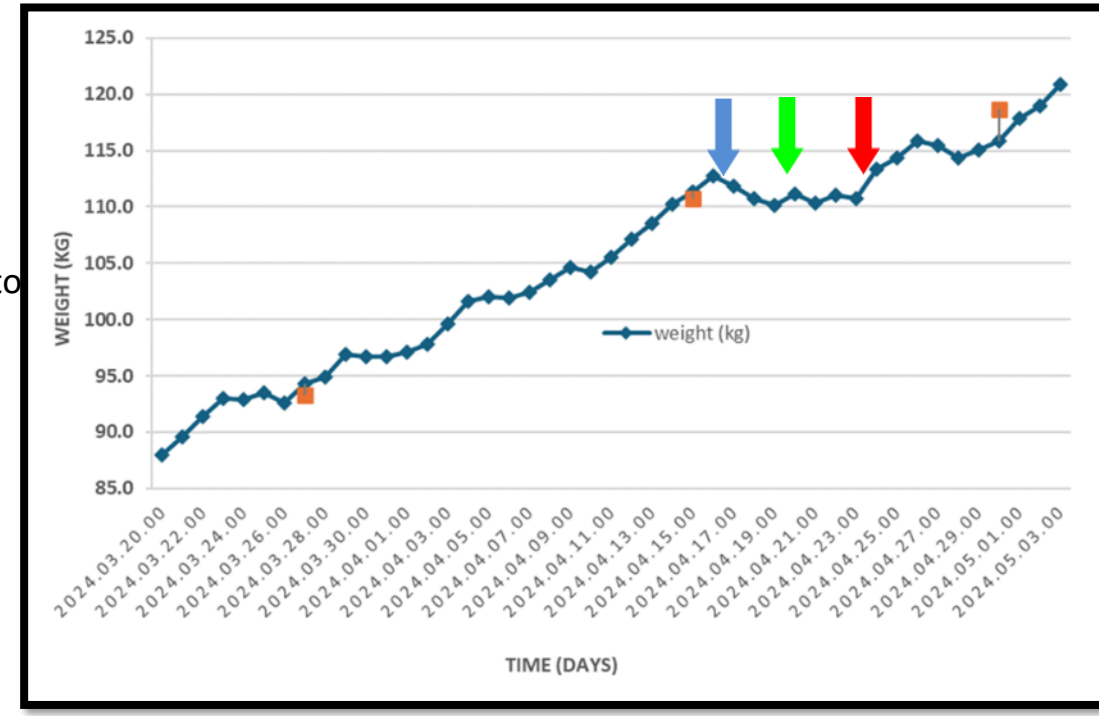


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Main Results in Pilot 2_ At Farm

Funded by the European Union

- Good liveweight prediction → Prediction error around 5%
- Capacity to detect stagnation in live weight under disease or negative weather or feed conditions → possibility to act more quickly to reduce the impact of AW challenge
- Example mild health challenge:
  - Start of weight stagnation (mild flu starting)
  - Administered medical treatment for flu
  - Proposed date for medical treatment using WD



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More information: Banhazi, M. Dunn, A. Banhazi, J. Reixach, A. Ramon-Perez, P. Llonch and J. Maselyne (2025) Sub-clinical respiratory infection identified on farms by monitoring weight changes of pigs with the Weight-Detect instrument Agronomy Research 23(S1), 5–14, https://doi.org/10.15159/AR.25.032

Boimah, M., Thobe, P., Banhazi, T. (2026) Integrating welfare and economic assessment of the Weight-Detect AI system in commercial pig production. EAAP Communication, Hamburg, Germany.

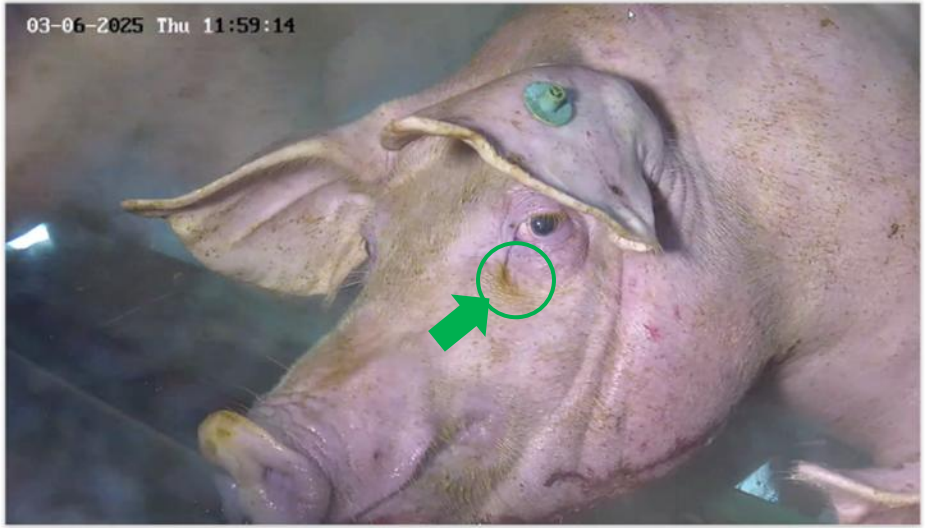
Main Results in Pilot 2_ At Slaughterhouse

Funded by the European Union

TEAR STAINING SENSOR

- **WHAT DOES IT MEASURE?**

Tear stain surface as AW indicator





- Significative increase in TRL (Technical Readiness level)
- Still under development by ILVO and UAB scientists

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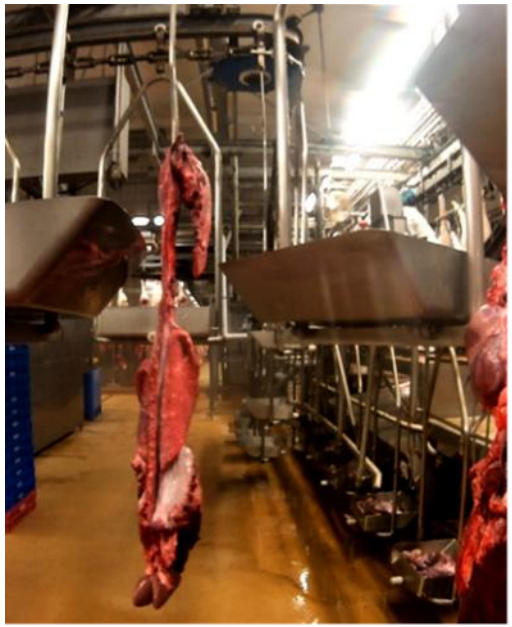
Main Results in Pilot 2_ At Slaughterhouse

Funded by the European Union

LESION DETECT

- **WHAT DOES IT MEASURE?**

Score the lung lesions related with respiratory diseases using vision AI algorithms





Innotech

- Significative increase in TRL (Technical Readiness Level)
- Still under development

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Main Results in Pilot 2_ At Slaughterhouse

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CONCIOUSNESS SENSOR

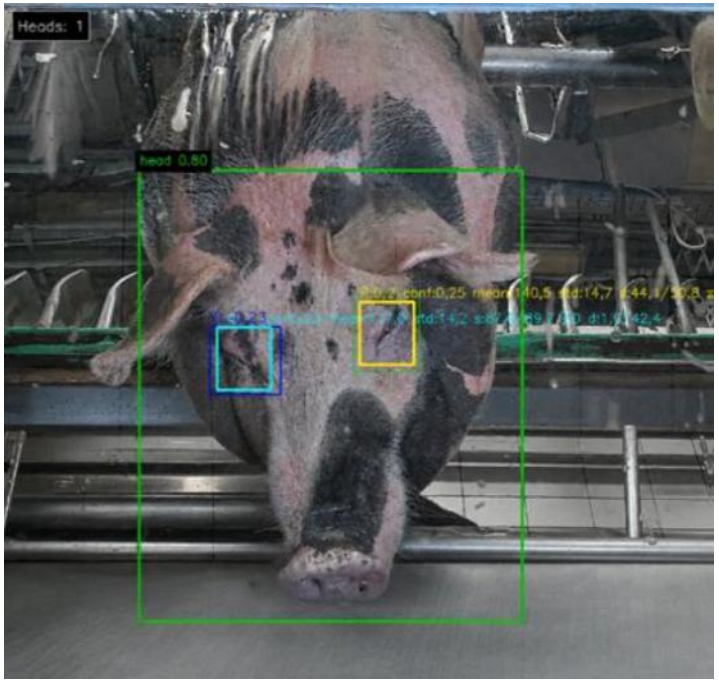
BlinkAI

Real-time computer vision technology for post-CO_2 stunning assessment under slaughterhouse conditions

- **WHAT DOES IT MEASURE?**

Reaction (blinking) of the eye under corneal reflex test done just after the bleeding

- Difficult image collection associated to harsh environment → but good results when solved



nunasolutions

aWISH

More information: Ramon-Pérez, A. et al. (2026). Automated corneal reflex tracking using AI for real-time assessment of pig stunning in a commercial abattoir (under review)

Main Results in Pilot 2_ At Slaughterhouse

Funded by the European Union

TAIL LENGTH CLASSIFIER

Real-time computer vision AI technology for assessment of tail category

- **WHAT DOES IT MEASURE?**

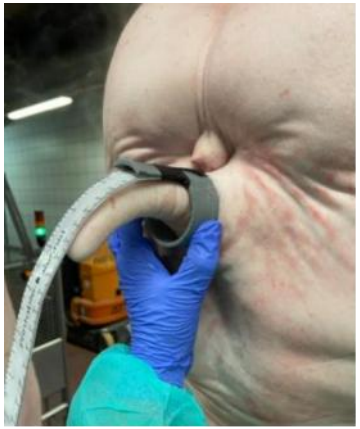
The tail type of every slaughtered pig:

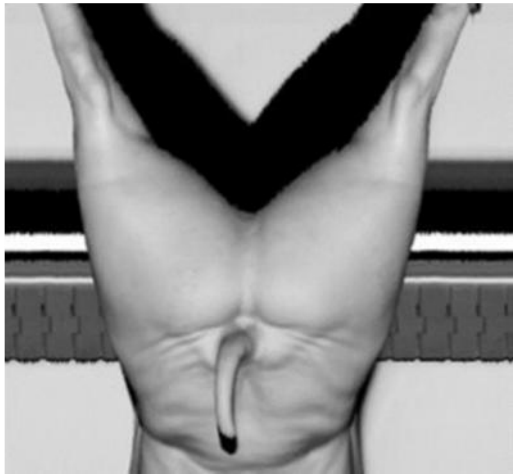
- Necrosed tail
- Cicatrized tail

} Tail biting outbreaks

- Short tail lenght
- Medium tail lenght
- Large tail lenght

} Tail docking practices





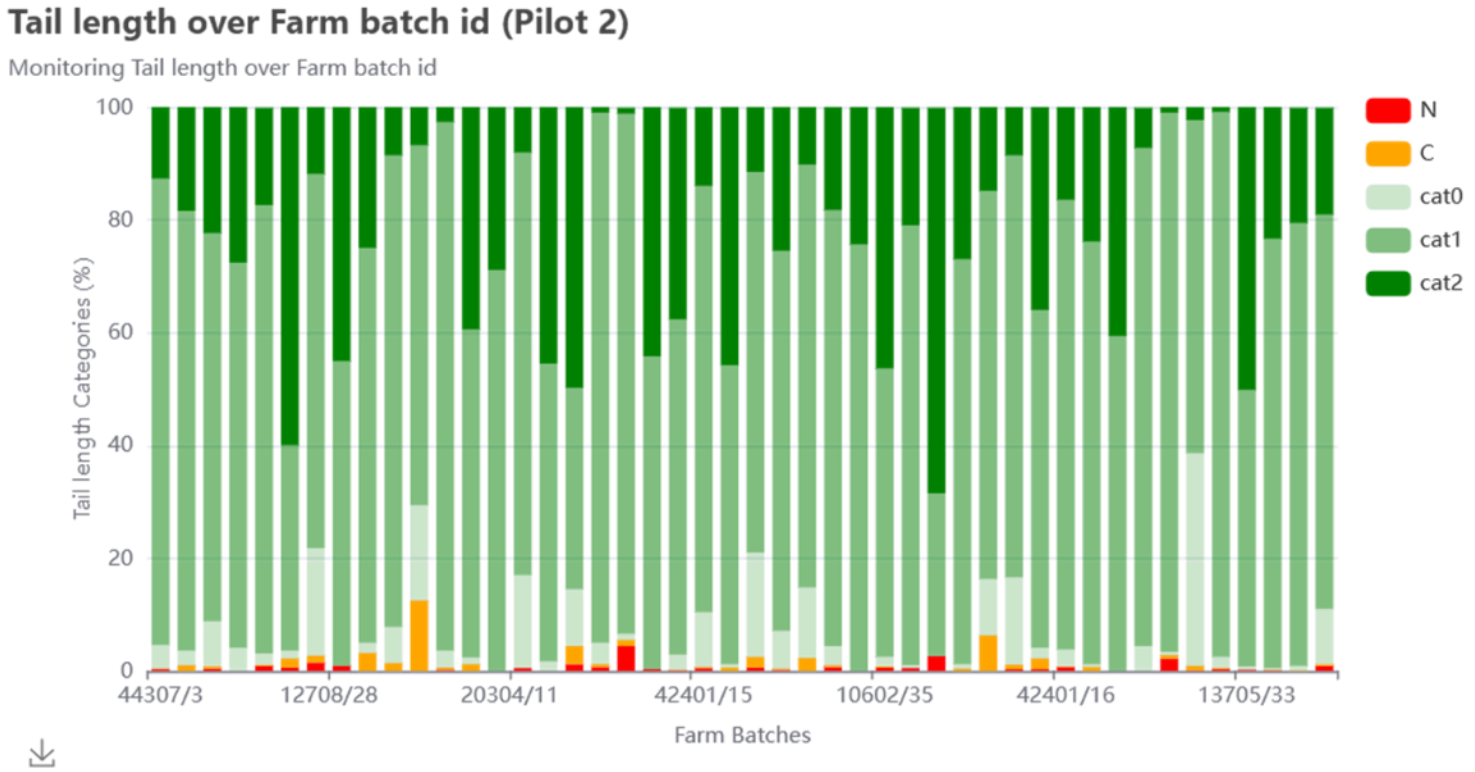
Overall F-score ~ 0,85
→ GOOD RESULTS

More information: Ramon-Pérez, A. et al. (2026). Development and validation of an automated image-based system for tail lesions and tail length assessment in a commercial pig slaughterhouse (submitted, under review)

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Main Results in Pilot 2_ At Slaughterhouse

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Source: AWISH Data platform

At Farm_ Conclusions & Future

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- We obtained some useful batch/farm animal welfare indicators for continuous objective welfare assessment.

- Some sensors helps in daily decision-making processes, identifying batch AW challenges related with health, environment, nutrition, etc.

Next steps at Batallé

- Bottleneck at farm --> Number of pigs monitorized by sensor --> Use of portable or mobile sensors
- Use of sensors for continuous liveweight monitoring and/or feed intake monitoring and/or water intake monitoring

- New R&D project proposal submitted
→ 2026 European AEI-Agri Call

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At Slaughterhouse_ Conclusions & Future

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- We obtained some useful individual/batch AW indicators for continuous objective welfare assessment.
- Some sensors permits:

-Retrospective view of AW conditions until slaughter of pig

-Real-time monitoring of processes using objective AW indicators

- Slaughterhouse is a very good place to obtain retrospective information of AW indicators at individual/ batch level.

Next steps at Batallé

- Data from Tail Lenght sensor will be used in new internal R&D projects in order to study key factors (including genetics) associated to tail biting → feedback to the farm
- New R&D project proposal for BlinkAI sensor submitted to a Regional call

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Broiler pilot experiences

Jorinde Mulder (Plukon Food Group)

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Pilot 3 – DUC Chailley



Broiler slaughterhouse in France, part of Plukon Food Group. DUC Chailley has an integrated chain.

Scientific co-lead: ITAVI
Technology providers: ITAVI and CLK GmbH

Six technologies installed on farm, during transport or at slaughter

Why aWISH?

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Animal Welfare

- Growing market expectations
- Create value across the chain
- Optimize procedures and conditions

In Slaughterhouse

- Need for objective, continuous and standardized measurements
- Potential for automated welfare monitoring
- Link measurements to improvements

Good animal welfare is not only the right thing to do; it improves quality, efficiency, compliance and business performance.

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Sensor technologies –Broiler pilots

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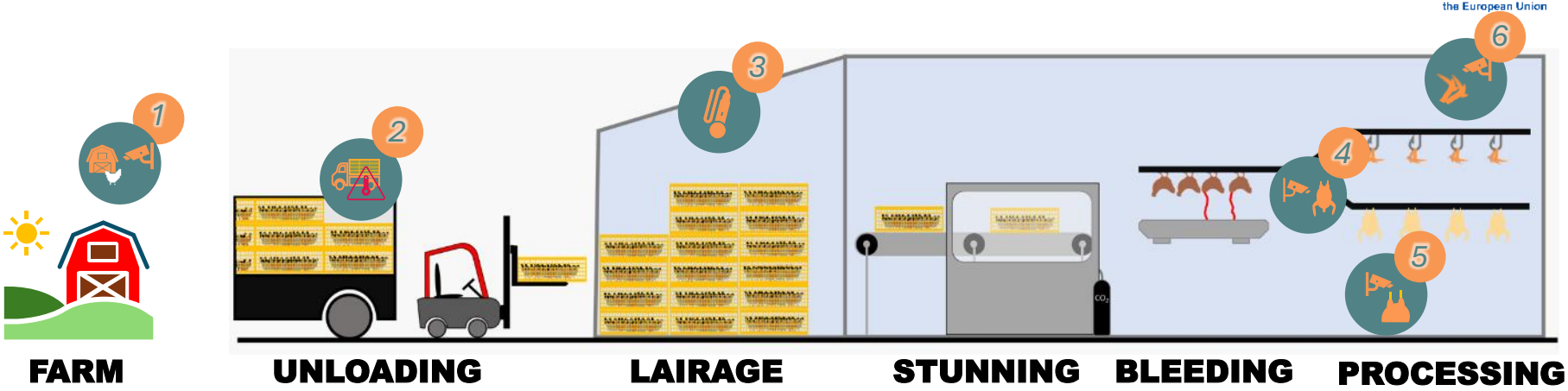


Figure adapted from NVWA figure (Sensortechnology at the slaughterhouse)

New 1 EBroilerTrack Image (ITAVI) – Individual broiler activity on farm

New 2 Transport monitoring (ITAVI) – model for heat stress

New 3 EBroilerTrack Sound (ITAVI) – Broiler vocalizations

New 4 ChickenCheck Catch Damage (CLK) – Catching damage (bruises and fractures) and scratches

5 ChickenCheck Hockburn (CLK) –Hockburns

6 ChickenCheck Footpad (CLK) –Footpad dermatitis

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Implementation challenges

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Technical

- Integration in existing lines
- Harsh processing environment (humidity, dust, etc.)
- Limited space
- Equipment robustness and reliability

Operational

- Trust in the system
- Training staff
- Adopting new procedures

Data & IT

- Integration with existing infrastructure
- Data storage and management
- Converting data to insights
- Data quality and validation

Innovation & Development

- *Requirements might change*
- *Testing demands time*
- *Technology not yet proven at commercial scale*

Stakeholder adoption

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What worked

- Farmers saw value in objective data
- Automated monitoring created new opportunities for dialogue
- Data helped identify trends that would otherwise go unnoticed
- Feedback supported continuous improvement efforts

Implementation reality

- Turning data into action proved more difficult than collecting data
- Trust in results need to be built over time
- A separate platform limited engagement, as users preferred existing systems
- Existing routines are hard to change

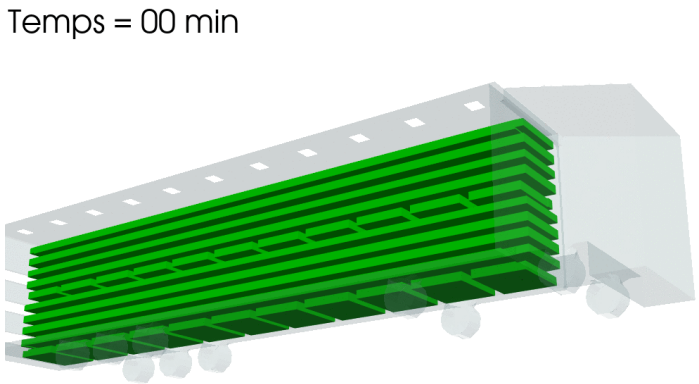
Technology generates data. People create improvement.

Key results

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Transport modelling - ITAVI

- Developed a model to predict heat stress risk during transport
- Combines effective temperature, humidity, CO2 and transport distance
- Enables identification of high-risk transport conditions before transport takes place
- Potential to reduce DOAs and heat stress through preventive actions



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Key results

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EBroilerTrack Sound - ITAVI

- Harsh environment for microphones lead to technical trouble
- Equipment noise interfered sound collection
- Isolation relevant broiler sounds from background noise proved challenging
- Interpretation required linkage with parameters such as light intensity (lux), temperature and humidity
- Translating sound patterns into actionable welfare indicators proved challenging

Key results

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ChickenCheck - CLK

- Automated detection of footpad lesions and hock burns successfully validated
- Provides objective and consistent welfare assessment
- Supports standardized welfare feedback across flocks
- Robust image quality is critical for reliable scoring



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Future Potential

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Opportunities

- Objective, continuous and standardized welfare monitoring
- Earlier identification of welfare risks and trends
- More targeted feedback to farmers and transport
- Stronger benchmarking
- Data-drive welfare and operational decision-making

Unlocking Value

- Turn welfare observations into actionable improvements
- Create a continuous feedback loop between farmers, transport and slaughterhouses
- Integrate into existing systems and workflows

Automated welfare monitoring is technically feasible; creating impact requires people, processes and continuous use of the insights generated.

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COFFEE BREAK

10 min

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Opportunities for future uptake by the meat industry

Turning welfare evidence into routine decisions and better outcomes for animals

Dr Helen Lambert
Consultant
Eurogroup for Animals

EUROGROUP FOR ANIMALS

Funded by the European Union

website: awish-project.eu
email: awish@ilvo.vlaanderen.be

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The opportunity after aWISH



Routine decisions

Use welfare findings to guide animal management, handling, transport, slaughter and purchasing decisions.

Clear responsibility

Agree on who receives the findings, who takes action and how progress is followed up.

Better outcomes

Check whether those actions improve welfare for animals and use the results to guide further changes.

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aWISH connects evidence with action

Indicators and technologies

Detect relevant welfare problems.



Data and feedback

Bring findings to the people who can act.

Pilot and uptake experience

Identify conditions for wider use.

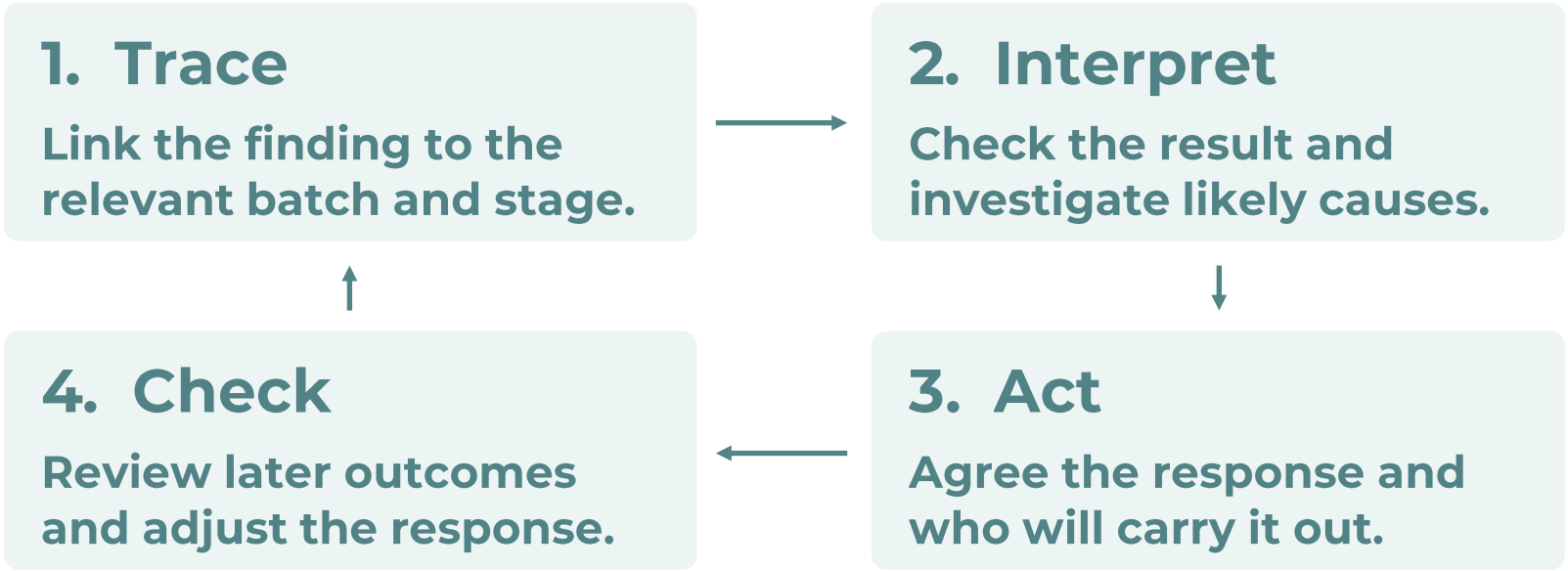
Best Practice Guides

Support the choice of response.

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Welfare feedback across the supply chain

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Existing relationships connect findings with decisions.

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Timing of welfare feedback

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Current welfare concerns

Prompt action through welfare procedures

For example: handling or stunning.

Retrospective findings

Prevent recurrence in subsequent animals

For example: lesions found on carcasses.

Both need a named response and follow-up.

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Learning from welfare results

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Progress over time

Comparable results across batches.

Learning between sites

Shared learning from comparable results.

Farm context

Conditions that help explain differences.

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Fund monitoring and welfare improvements

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People	Infrastructure	Welfare improvements
Training, advice and time to act.	Equipment, integration and maintenance.	Funding for management and housing changes.

Budget for the system and the response.

Use standards and animal outcomes together

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Production standards

Conditions and practices that support welfare

For example: housing and handling.

Animal outcomes

Evidence about how animals are doing

For example: injuries and signs of disease.

website: awish-project.eu
email: awish@ilvo.vlaanderen.be

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Make welfare claims match the evidence



What was measured?

State the welfare aspects covered.

Which animals and stages?

Be clear about the scope of assessment.

How was it verified?

Maintain traceability and suitable checks.

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Be clear about what a welfare score shows.

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aWISH's case for EU policy



Legislation and enforcement

Use validated indicators alongside strong minimum welfare standards.

Common EU methods

Align measurement, interpretation and reporting across countries.

Funding and practical support

Enable welfare improvements through CAP funding, guidance and training.

Bring aWISH evidence into welfare law, official controls and support for implementation.

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Carrying aWISH forward

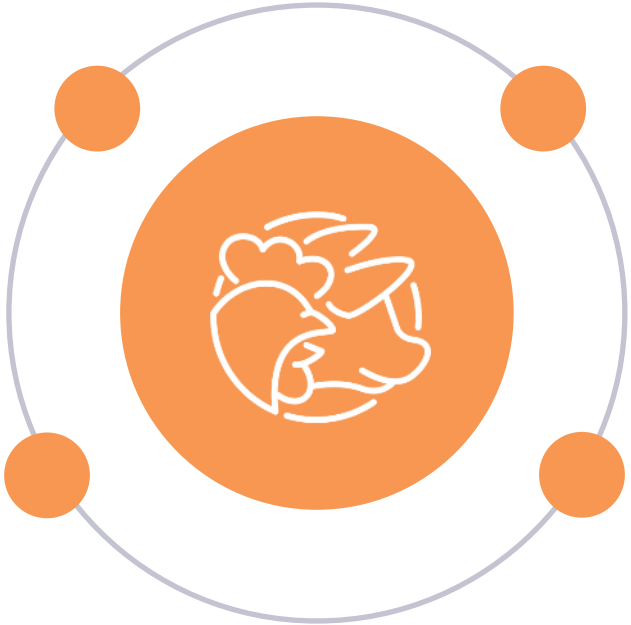
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1. **Use the outputs**

   Bring findings and guidance into routine welfare decisions.

2. **Continue collaboration**

   Keep supply-chain partners and advisers connected.



3. **Sustain the tools**

   Agree access, maintenance and technical support.

4. **Demonstrate progress**
   Follow welfare outcomes and share practical lessons.

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Judge uptake by what improves for animals



Less harm

Reduce both the frequency and severity of injury, disease and distress.

Prompt action

Turn serious welfare findings into timely responses, with clear responsibility and follow-up.

Lasting improvement

Maintain better outcomes across production cycles.

Better lives for animals are the test of uptake.

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Thank you.
Questions?

Dr Helen Lambert
h.lambert@eurogroupforanimals.org

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Round Table Discussion

12:00 – 12:45

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Round table discussion:
Animal welfare data: creating value across the meat supply chain

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- Moderator: Pol Llonch (UAB)

- Panellists:
  - Jordi Canet — Norfrisa
  - Juliette Zamparini — Plukon
  - Annaig Thomas — Symrise
  - Nathan Williams — BBFAW
  - Helen Lambert — Eurogroup for Animals
  - Thomas Banhazi — Innotech Vision

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Closing

UAB & INNOVACC

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Thank you!

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