THE FUTURE OF ANIMAL WELFARE MONITORING IN THE MEAT SUPPLY CHAIN

WEBINAR REPORTING

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ABSTRACT

The aWISH Industry Event, "The Future of Animal Welfare Monitoring in the Meat Supply Chain", presented the project's main findings on automated animal welfare monitoring across pig and broiler supply chains. Researchers, technology providers, slaughterhouse representatives and other stakeholders discussed sensor validation, the integration of farm, transport and slaughterhouse data, practical welfare improvements, and future industrial uptake. The event emphasised that monitoring creates value when reliable indicators are translated into management actions and verified improvements.

Webinar General Information

Webinar's date, duration, moderators

Table 1. General information about the webinar

Workshop's details	**Description**
Title	***The Future of Animal Welfare Monitoring in the Meat Supply Chain***
Date	08/10/2026
Duration	Approximately 2 hours and 40 minutes (according to the event report)
Format	Online
Venue (if offline)	-
Methodology	Technical presentations, presentation of project outcomes and a final industry roundtable discussion
Organiser	INNOVACC – EV ILVO - CONSULAI
Audience (number of participants)	108
Content	Automated welfare technologies; pig and broiler pilot results; scientific validation; aWISH Data Platform; best practice guidelines; socioeconomic impacts; industrial implementation and future uptake.
Keynote speaker	-

Table 2. Support staff and roles during the workshop

Name and organisation	Role
Ariadna Montals - INNOVACC	Presenter
Noémie Van Noten - ILVO	Presenter and technical support
Bas Rodenburg – Utrech University	Presenter
Kostas Perakis - Ubitech	Presenter
Maite Jachens - TiHo	Presenter
Mavis Boimah – Thünen	Presenter
Josep Reixach- Batallé	Presenter
Jorinde Mulder – Plukon	Presenter
Juliette Zamparini - Plukon	Participant in the panel discussion
Helen Lambert – Eurogroup for Animals	Presenter and participant in the panel discussion
Pol Llonch- UAB	Moderator in the panel discussion
Jordi Canet- Norfrisa	Participant in the panel discussion
Annaig Thomas – Symrise (external company of the project)	Participant in the panel discussion
Nathan Williams – BBFAW (external company of the project)	Participant in the panel discussion
Thomas Banhazi – Innotech Vision	Participant in the panel discussion

Detailed Remarks From The Workshop's Sessions

Introductory session

The event introduced the aWISH project's ambition to support large-scale, objective welfare assessment using animal-based indicators. The project involved 28 partners across 11 countries and six pilot sites, including four pig and two broiler pilots. Slaughterhouses were presented as important monitoring points, while the need to complement slaughterhouse data with farm and transport observations was emphasised.



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Core Session: Techniques, Questions and Answers

Automated monitoring technologies

Pig monitoring technologies included WeightDetect for contact-free weight estimation, acoustic monitoring of stress-related vocalisations, Blink AI for supporting stunning-effectiveness assessment, LesionDetect for lung lesions and PigInspector for tail, ear and skin indicators. Broiler technologies included an on-farm camera system, a transport heat-stress model, acoustic monitoring and ChickenCheck for footpad dermatitis, hock burns and catching-related injuries.

Scientific validation and welfare outcomes

Broiler pilot comparisons showed strong agreement between automated and trained human lesion assessments. In the French pilot (27 flocks), better litter quality was associated with better footpad health. In the Polish pilot (285 flocks), bedding type was associated with footpad outcomes. A Dutch pig intervention involving ten farms linked climate-management advice to lower ammonia exposure and fewer coughing events, while broader welfare improvements were limited.

Data platform and best practice guidelines

The UBITECH-developed aWISH Data Platform integrates datasets from farms, transport and slaughterhouses and provides dashboards, benchmarking, access controls and alerts. Nine best practice guides were developed: four for pigs, four for broilers and one for monitoring and feedback systems. Their proposed improvement cycle is monitor, analyse, act and evaluate.

Socioeconomic assessment

The event considered potential financial benefits of earlier disease detection through automated weight monitoring, as well as trade-offs between welfare, logistics and gross margins in broiler heat-stress mitigation. Economic estimates were partly model-based and were not presented as guaranteed returns.

Industrial implementation and future uptake

Pilot representatives described installation, site adjustment, algorithm training, validation and workflow integration as essential implementation stages. Challenges included noise, humidity, cleaning, processing speed, data interoperability, staff training and user acceptance. Presentations explored feedback to producers, welfare assurance, transparent communication and policy applications.

Interactive session(s) (if applicable)

The final roundtable brought together different parts of the meat supply chain. Discussion themes included:

Data reliability and harmonisation: Participants stressed that monitoring technologies must produce consistent, validated results. Harmonised methods are particularly important if indicators are to be used for benchmarking, certification or regulatory purposes.

Practical implementation: Industry representatives highlighted the need to integrate monitoring systems into existing operational procedures. Technologies must be robust, economically feasible and easy for staff to use.

Stakeholder collaboration: The discussion underlined the importance of communication between farmers, transporters, slaughterhouses, researchers and technology providers. Effective feedback mechanisms are necessary to translate data into improvements.

Consumer communication and trust: Participants discussed the potential value of objective welfare information for consumer communication. However, they also recognised that consumers may find existing labels and welfare claims confusing. Transparent, verifiable and harmonised information was therefore considered important.

Economic incentives: The roundtable acknowledged that improving welfare can involve additional costs and that consumer willingness to pay may not always translate into purchasing behaviour. Wider adoption will require realistic business models and appropriate incentives throughout the supply chain.

Policy and regulatory involvement: Several participants supported the development of harmonised welfare indicators and greater engagement with public authorities to establish credible methods and standards.

The discussion reinforced the need for collaboration across the supply chain and for a coordinated approach combining technology, management, economics and policy.

Conclusions

The event provided an opportunity to discuss the practical experiences gained during the aWISH pilot activities and, particularly through the final roundtable, to exchange views on the opportunities and challenges associated with the implementation of automated animal welfare monitoring in the meat industry.

The experiences shared by the pilot representatives from Batallé and Plukon showed the importance of testing and adapting monitoring technologies to real industrial conditions. The implementation of these systems involves more than developing a reliable sensor or algorithm. Installation, adaptation to each facility, algorithm training, validation and integration into existing workflows are all necessary steps. In practice, factors such as noise, humidity, cleaning procedures and processing speed can affect system performance and need to be considered during implementation. These experiences illustrated the importance of involving industry representatives in the development and testing process to ensure that solutions respond to actual operational needs.

Building on these experiences, the roundtable discussion highlighted that the main value of automated animal welfare monitoring lies in the effective use of the data generated. Industry representatives stressed that monitoring should support the identification of recurring problems, provide useful information for decision-making and help implement corrective and preventive measures. For example, observations collected at slaughterhouses can help identify potential issues related to farm management, catching, transport or processing conditions. However, this information only becomes useful when it is shared with the relevant actors and translated into improvements. The objective should therefore be to establish effective feedback mechanisms and use welfare data as part of routine management practices.

Another important topic was the need to move towards more integrated monitoring systems. Rather than developing individual technologies that operate independently, participants expressed the need for solutions that can combine different welfare indicators and connect information from farms, transport and slaughterhouses. Real-time alerts, dashboards, traceability systems and trend analysis were identified as useful functionalities to support faster decisions and a more preventive approach. This would also allow companies to compare performance between sites or supplier groups, assess the effectiveness of corrective actions and identify areas requiring further improvement.

The discussion also addressed the technical and regulatory conditions required for wider implementation. Participants agreed that automated indicators must be scientifically validated and demonstrate consistent performance under commercial conditions. Common definitions, harmonized assessment methods and interoperable data formats are particularly important if results are to be compared between facilities and countries or used for benchmarking, certification and official controls. In addition, clear arrangements are needed regarding data ownership, access rights, confidentiality and cybersecurity, especially as monitoring systems increasingly rely on connected platforms and cloud-based solutions.

Several risks associated with the use of automated assessment technologies were also raised. One of the main concerns was that systems should not focus exclusively on welfare indicators that are easier to measure automatically, potentially overlooking other relevant aspects of animal welfare. Participants also emphasised that AI-based assessments should support, rather than replace, professional judgement and expert knowledge. In particular, automated measurements should always be interpreted in their operational and biological context. The use of welfare data should primarily encourage prevention and continuous improvement, rather than becoming a purely punitive instrument. Prematurely linking individual measurements to sanctions, without sufficiently harmonised methods and agreed scientific criteria, could create uncertainty for companies and discourage the open exchange of information.

The different contributions also underlined that successful implementation requires cooperation across the entire value chain. Slaughterhouses, farmers, transport operators, technology providers, researchers, animal welfare organisations and public authorities all have a role to play. While companies need to integrate welfare information into their daily operations, technology providers must continue improving the reliability and interoperability of their solutions. Research organizations should support scientific validation, while public authorities and assurance schemes can contribute by providing common standards and clear guidance on how automated indicators should be used.

Finally, the economic dimension remains an important consideration for industrial uptake. Although automated monitoring can support better welfare management and more informed operational decisions, investment costs and the distribution of costs and benefits across the supply chain need to be considered. Participants pointed out that improved welfare does not automatically translate into a higher willingness to pay from consumers. Therefore, realistic business models and appropriate incentives will be needed to support companies in adopting these technologies in the long term.

Overall, the experiences shared by the pilot representatives and the final roundtable showed that the transition towards automated animal welfare monitoring requires more than technological development. The priority is to ensure that these systems are reliable, economically viable and integrated into existing industrial processes, while providing information that can be understood and used by the different actors involved. The discussions confirmed that progress will depend on continued collaboration, harmonised approaches and clear implementation pathways. Ultimately, the success of automated monitoring should be measured not by the amount of data collected, but by its contribution to better decision-making and measurable improvements in animal welfare throughout the meat supply chain.

Recommendations for the Meat industry

Based on the presentations and discussions, the following actions are recommended:

1. Prioritise validated technologies that have demonstrated reliable performance under relevant commercial operating conditions.
2. Integrate welfare monitoring data across production stages to obtain a more comprehensive understanding of animal welfare.
3. Establish clear feedback mechanisms between slaughterhouses, farmers and transport operators.
4. Use best practice guidelines to convert identified welfare problems into targeted corrective actions.
5. Evaluate economic and operational impacts before implementing monitoring technologies at commercial scale.
6. Promote common indicators and harmonised assessment methods to improve comparability and stakeholder confidence.
7. Develop collaborative approaches to investment and improvement, recognising that costs and benefits may be distributed across the supply chain.
8. Continue validating welfare outcomes to demonstrate that monitoring-based interventions result in measurable improvements for animals.

Round table feedback and interactive session inputs

Plukon

1.Do you think the technology developed in the aWISH project has the potential to be applied in practice?
Yes. We see strong potential for automated welfare-monitoring technologies in slaughterhouses, particularly when they provide objective, continuous, and standardized measurements across our organisation.
For Plukon, the real value lies in turning welfare observations into actionable improvements. Data collected at slaughter can help identify issues related to farm management, transport, catching, or processing conditions.
If properly integrated into existing management systems, these technologies can strengthen the feedback loop between farms, logistics partners, and slaughterhouses, ultimately improving both animal welfare and operational performance.

2. What technologies would you like to see applied in slaughterhouses in the near future?

We would like to see welfare-monitoring technologies become part of an integrated decision-support system rather than stand-alone tools.

Examples include:

- Automated assessment of welfare indicators such as injuries, footpad condition, bruising, DOA rates.
- Real-time dashboards that alert operators when welfare deviations occur.
- Traceability systems linking slaughterhouse observations back to farms, transport routes, and catching teams when possible.
- AI-supported trend analysis allowing preventive actions implementation.

The ultimate objective is faster decision-making and continuous welfare improvement across the entire supply chain.

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3. What barriers do you identify when applying sensors and AI for monitoring in slaughterhouses?

Several barriers need to be addressed before widespread implementation:

- **Validation and reliability:** Technologies must demonstrate consistent performance under commercial slaughterhouse conditions with varying bird types, line speeds, and operational environments.
- **Standardization:** Common methodologies and definitions are needed to ensure results are comparable between plants, countries, and animal welfare certification schemes.
- **Data integration:** New systems must connect easily with existing operational and quality-management systems.
- **Cybersecurity and data protection:** As welfare-monitoring systems increasingly rely on cloud connectivity, AI platforms and interconnected production systems, robust cybersecurity measures become essential. Companies need assurance that sensitive operational data are protected against unauthorized access, cyberattacks and data breaches. Particular attention should be given to secure data transfer, access management, supplier cybersecurity standards and compliance with data protection regulations.
- **Cost-benefit considerations:** Investments must generate measurable welfare improvements while remaining economically sustainable.
- **Data governance:** Clear rules are needed regarding data ownership, access rights, confidentiality, and the use of results by competent authorities and certification schemes.
- **Workforce acceptance:** Successful implementation requires engagement and training of operational teams from concerned stakeholders of the value chain.

4. What risks should we consider when developing and implementing automated assessment technologies?

Technology should support expert decision-making, not replace it.

Key risks include:

- Focusing only on indicators that are easy to measure automatically while overlooking equally important welfare aspects.
- Overreliance on technology without maintaining human oversight and professional judgement.
- Generating large volumes of data without clear action plans for improvement.
- Creating administrative complexity that distracts resources from practical welfare improvements.
- Implementing technologies without sufficient scientific validation, leading to incorrect conclusions or unnecessary interventions.
- **Legislative and regulatory risks.** There is a risk that technologies developed for monitoring and continuous improvement could eventually be used in ways that were not originally intended. For example, welfare indicators generated by AI systems could become mandatory reporting requirements, audit criteria or regulatory benchmarks before sufficient harmonisation and scientific consensus have been achieved. Companies may therefore face uncertainty regarding compliance expectations, legal responsibilities and the interpretation of automatically generated data.

- Our concern is not the ability to measure welfare indicators accurately. On the contrary, we support objective and scientifically validated measurements. The risk arises if measurements at individual bird level are directly linked to sanctions without considering biological variability, operational context and population-level performance. Animal welfare monitoring should encourage continuous improvement and preventive action, rather than creating a system where the existence of a small number of unavoidable cases automatically results in non-compliance or penalties.
- **Differences in regulatory implementation across countries.** If different Member States, customers or certification schemes adopt different definitions, thresholds or acceptance criteria for automated welfare indicators, companies operating internationally may face inconsistent requirements and reduced comparability of results.
- **Risk of punitive rather than preventive use of data.** To encourage adoption, welfare monitoring systems should primarily support continuous improvement. If data are perceived mainly as enforcement tools, operators may become reluctant to share information openly, which could ultimately limit welfare progress.

The priority should remain genuine welfare improvement rather than data collection itself.

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5. What could different actors in the value chain do to improve practical application?

Improvement requires collaboration throughout the chain.

- **Farmers:** Use welfare feedback to continuously improve flock management and housing conditions.
- **Catching and transport partners:** Apply welfare data to optimize handling procedures and transport conditions.
- **Slaughterhouses:** Integrate welfare indicators into daily management routines, corrective actions, and continuous improvement programmes.
- **Technology providers:** Develop robust, user-friendly, and interoperable systems.
- **Researchers:** Continue validating indicators and demonstrating the relationship between measured outcomes and animal welfare.
- **Authorities and assurance schemes:** Provide harmonized standards and clear guidance on the use of automated monitoring systems.

Effective implementation will depend on creating a shared understanding of how data should be translated into practical improvements.

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6. What value do you place on animal-welfare data, and how could it be leveraged?

Animal-welfare data are highly valuable because they provide objective evidence to support continuous improvement.

Within Plukon, welfare data can be used to:

- Identify trends and recurring issues.
- Benchmark performance between sites, farms or supplier groups.
- Measure the effectiveness of corrective actions.
- Support training and best-practice sharing.
- Strengthen reporting towards our stakeholders.
- Enable a more risk-based and preventive management approach.

The greatest value comes when data are transformed into targeted actions that improve animal welfare outcomes throughout the supply chain. Welfare data should not simply be collected; they should be used to drive informed decisions and measurable improvements.



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Our key message

"Plukon supports the use of scientifically validated automated welfare-monitoring technologies that provide objective and actionable information. The greatest opportunity is not the technology itself, but the ability to use reliable welfare data to drive continuous improvement, strengthen collaboration across the supply chain, and prevent animal welfare issues before they occur."

EuroGroup for animals

1. ***Do you think the technology developed in the aWISH project has the potential to be applied in practice?*** *Yes, definitely. aWISH has shown the practical potential of automated welfare monitoring in commercial slaughterhouses. For me, the real opportunity is creating feedback loops across the chain, so recurring problems can be identified and addressed. At policy level, aggregated data could also support risk-based oversight and help assess whether welfare standards are working.*

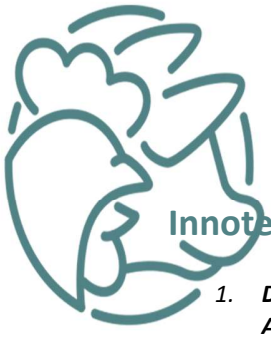
2. ***What technologies would you like to see applied in slaughterhouses in the near future?*** *My wish would be for integrated systems, not just more individual technologies. aWISH has done valuable work developing and testing automated approaches. The next step is linking them, so welfare problems identified at slaughter can be traced back and acted on. The goal is not simply more sensors, but better information that prevents poor welfare recurring.*

3. ***What barriers do you identify when applying sensors and AI for monitoring in slaughterhouses?*** *The biggest barriers are not only technical, but also regulatory and institutional. Systems need to work reliably under commercial conditions, but for policy use we also need common definitions, validation standards and interoperable data so results are comparable. We then need clarity on how those data fit into official controls or assurance systems, who owns and accesses them, and crucially what action should follow when a welfare problem is identified.*

4. ***What risks should we consider when developing and implementing automated assessment technologies?*** *One risk is that technology starts to determine what we measure, rather than welfare science determining what matters. The easiest indicators to automate are not necessarily the most important for animals. We must also avoid monitoring becoming a substitute for prevention. Automation should help prevent poor welfare, not simply document it better.*

5. ***What could different actors in the value chain do to improve practical application?*** *The next step is to move from successful pilots to clear implementation pathways. Policymakers can provide common standards, slaughterhouses can integrate welfare data into routine decisions, and technology companies can improve interoperability. Scientists and NGOs can help ensure that implementation stays focused on meaningful welfare outcomes rather than technology for its own sake.*

6. ***What value do you place on animal-welfare data, and how could it be leveraged?*** *From an NGO and policy perspective, welfare data tell us whether standards are actually delivering for animals. They can reveal systemic problems, support risk-based oversight and help evaluate policy over time. For me, their real value is accountability: turning welfare outcomes into evidence that drives better decisions.*



Innotech Vision

1. ***Do you think the technology developed in the aWISH project has the potential to be applied in practice?*** ***A:*** *Absolutely. One of the important achievements of aWISH has been demonstrating that innovative sensor- and AI-based approaches can move beyond proof-of-concept towards practical welfare monitoring under commercial conditions, providing objective information that complements existing welfare assessment. Without unfairly favouring specific technologies trialled during the project, we can say that generally most of the technologies that were included in this study demonstrated their usefulness during the aWISH project.*

2. ***What technologies would you like to see applied in slaughterhouses in the near future? A:*** *Many of the approaches explored within aWISH point exactly in this direction: computer vision, AI and other sensor technologies capable of continuously and automatically detecting meaningful animal-welfare indicators. I would particularly like to see these technologies integrated so that slaughterhouses receive useful, near-real-time information rather than simply collecting more data.*

3. ***What barriers do you identify when applying sensors and AI for monitoring in slaughterhouses? A:*** *aWISH has also helped demonstrate that developing a successful algorithm is only part of the journey: technologies need to work reliably under challenging commercial conditions and integrate into existing processes. Validation, interoperability, cost, staff acceptance and converting sensor outputs into actionable information remain important challenges.*

4. ***What risks should we consider when developing and implementing automated assessment technologies?*** ***A:*** *We need to avoid assuming that an automated system is automatically an infallible system. The important principles reinforced through aWISH are the need for transparent validation and maintenance of appropriate human oversight when technologies are used to support welfare decisions.*

5. ***What could different actors in the value chain do to improve practical application? A:*** *The collaborative model used in aWISH is itself part of the answer: technology companies, research and innovation organisations, slaughterhouses and other value-chain actors need to develop and validate solutions together. Continued access to commercial environments for testing and co-development will be essential for turning promising aWISH outcomes and innovations into routinely used tools.*

6. ***What value do you place on animal-welfare data, and how could it be leveraged? A:*** *Animal-welfare data become particularly powerful when technologies such as those developed and evaluated within aWISH make them more continuous, objective and scalable. These data can support benchmarking, early identification of welfare problems, evaluation of interventions and, ultimately, more evidence-based welfare management across the entire value chain.*