



D1.6: PRACTICE ABSTRACTS – BATCH 1



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ABSTRACT

aWISH project aims to develop and offer a cost-efficient solution to evaluate and improve the welfare of meat producing livestock at a large scale, across Europe. This approach will be developed and evaluated in close collaboration with all actors involved, from primary producers up to policy makers and citizens.



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TABLE OF CONTENTS

1.	Introduction	7
1.1.	Objective	7
1.2.	Link to other tasks or WPs	7
2.	Practice Abstracts	8
2.1.	D2.1. - Valid AWI for pigs and broilers, on farm, loading, transport and at slaughter... 8	8
2.2.	D2.2. - Technology and sensors capable of assessing pig and broiler welfare..... 8	8
2.3.	Pilot 1 – Vion – Technology implementation in pig production	9
2.4.	Pilot 2– Batallé – Technology implementation in pig production	9
2.5.	Pilot 3 – Duc – Technology implementation in broilerproduction	10
2.6.	Pilot 4 - Plukon – Technology implementation in broiler production	10
2.7.	Pilot 5 – Grossfurtner – Technology implementation in pig production..... 11	11
2.8.	Pilot 6 – Carnex – Technology implementation in pig production	11
3.	Conclusion and Next Steps	12



GLOSSARY OF ACRONYMS

Acronym / Term	Description
F2F	Farm-to-Fork
AW	Animal Welfare
AWI	Animal Welfare Indicators
SH	Slaughter House
WP	Work Package



EXECUTIVE SUMMARY

This deliverable provides the first batch of Practice Abstracts from the aWISH project, a total of eight Practice Abstracts, out of at least twenty-four.

The aim of these Practice Abstracts is to disseminate the project's results and lessons learned, as part of Task 1.3 Dissemination of project results (M12-M48). This task includes dissemination activities for the different categories of actors such as participation at conferences, seminars and agricultural fairs, production of (scientific) publications, dissemination materials and broadcasts, dissemination of an animal welfare (AW) catalogue and best practice guides, and organization of the final international conference with other EU projects and initiatives.

These Practice Abstracts and the project details will be submitted to the EU CAP platform, and will ultimately be published on the EU CAP Network website. The Practice Abstracts are summaries in a common new format to provide farmers, advisers, consumers, and others, with concise and practical information about the different projects. They help innovative and practice-oriented projects share their knowledge in a concise, harmonized and practice-oriented way from the start till the end of the project. The use of this format also enables the several stakeholders across the EU to contact each other.

The Practice Abstracts produced in this first batch are about Deliverable 2.1. Valid AWI for pigs and broilers, on farm, loading, transport and at slaughter, Deliverable 2.2. Technology and sensors capable of assessing pig and broiler welfare, and the different technologies implemented in each Pilot.

DISCLAIMER

The information and views set out in this deliverable are those of the authors and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf may be held responsible for the use which may be made of the following information.



1. Introduction

End-user material of the aWISH project will be produced in the form of several summaries for practitioners, so called Practice Abstracts. In this Deliverable 1.6. Practice Abstracts – batch 1, 8 different topics were assessed, resulting in 8 different Practice Abstracts.

All Practice Abstracts were submitted in the CAPNetwork platform and are waiting to be published on EU CAP Network website: [EIP-AGRI Project Database](#) | [European CAP Network \(europa.eu\)](#)

1.1. Objective

This Deliverable is part of WP1 “Communication, Dissemination & Exploitation”, specifically Task 1.3. - “Dissemination of project results” and serves the purpose of communicating to the Animal Welfare stakeholders short summaries about the work that has been done regarding the technologies implementation and the existing technological methodologies for measuring Animal Welfare Indicators in poultry and pig production. The goal is to produce at least 24 Practice Abstracts by the end of the project, and this report reflects the first batch of eight Practice Abstracts, to be delivered by the end of April 2024 (M18).

1.2. Link to other tasks or WPs

In this Deliverable 1.6. Practice Abstracts – batch 1, eight different themes were addressed, related to the work and respective deliverables from WP2 Animal Welfare indicators and catalogue and WP3 Technology development and large-scale piloting: One Practice Abstract from the D2.1. – “Report on valid AWI for pigs and broilers, on farm, loading, transport and at slaughter”; and one Practice Abstract from D2.2. – “Report on methodology for measuring each AWI”. Additionally, one Practice Abstract was written about each Pilot, making a total of 6 Practice Abstracts, regarding the technologies implemented in each Pilot.



2. Practice Abstracts

2.1. D2.1. - Valid AWI for pigs and broilers, on farm, loading, transport and at slaughter

One of the first steps to reach the aWISH objectives is to analyze animal welfare indicators (AWI) for pigs and broilers. For that, a first report was made on “Valid AWI for pigs and broilers, on farm, loading, transport and at slaughter”. The indicators are divided into five domains: good feeding, good housing, good health, appropriate behavior, and the mental domain, but also the welfare consequences proposed by EFSA. To gather the data two systematic reviews were done. A total of 136 indicators for pigs and 65 indicators for broilers were found. For both species, most indicators were found for on-farm animal welfare challenges (55% in pigs and 65% in broilers). While most welfare indicators were related to challenges occurring on farms, most of the measures for the indicators were taken at slaughter. The domain for which most indicators were found was good health, this was especially true for broilers in which approximately 80% of the indicators were good health-related, and the corresponding number for pigs was close to 30%. The validity of the measured indicators was in most cases supported by the literature.

2.2. D2.2. - Technology and sensors capable of assessing pig and broiler welfare

In an overview of technologies and sensors for assessing pig and broiler welfare in farming, 104 technologies for pig welfare and 68 for broiler welfare were identified, of which 88 and 56 were commercially available, respectively. These technologies target indicators like activity level, feeding behavior, body condition, and environmental parameters at different stages of production. For both pigs and broilers, technologies are categorized for on-farm use, transport, and slaughterhouses. While most are designed for on-farm use, there is a growing interest in developing technologies for slaughterhouse welfare assessment. Some prototypes aim to assess indicators such as carcass lesions, lung health, and tail length. Adapting algorithms/software for the slaughterhouse environment and having a transparent validation process were identified as being of high importance. Concerns were voiced regarding insufficient validation and potential bias when validations were conducted internally. The outcome emphasizes the need to expand sensor lists and transparency, external validation, and independent validation for better credibility in the sector.



2.3. Pilot 1 – Vion – Technology implementation in pig production

Pilot 1 of the aWISH project is led by the pig slaughterhouse Vion in Groenlo, the Netherlands, with the University of Utrecht as scientific co-lead. Three new technologies were implemented in the slaughterhouse. The first is the CLK *Pig Inspector* (TRL 5), an automated system that measures tail length and checks for skin, ear, and tail lesions on pig carcasses, using 2D and 3D color cameras. Insulin-like Growth Factors (IGF) and their binding proteins (BP) are involved in regulating animal growth, illness, and stress. Blood levels of these compounds may indicate accumulated stress or an acute response, depending on their ratios. This pilot collects blood samples for *IGF BP analysis* as stress indicators (performed by FBN, TRL 3), reflecting animal raising and handling quality. The third technology, *STREMODO* (TRL 5) developed by FBN, detects stress vocalization in pigs using hardware and software installed in the unloading and lairage area. It identifies stressful situations and helps to optimize handling procedures to reduce stress vocalizations in the future.

2.4. Pilot 2 – Batallé – Technology implementation in pig production

Pilot 2 of the aWISH project is led by the pig slaughterhouse Batallé in Catalonia, Spain, with the Autonomous University of Barcelona as scientific co-lead. In this pilot, 5 new technologies were installed: 3 sensors at the slaughterhouse and 2 on-farm. WEL2BE implemented a *stunning effectiveness* technology for pigs (TRL 5), evaluating if pigs are properly stunned in the gas tunnel by monitoring the corneal reflex. If a reaction is detected, the pig should be restunned immediately. A camera system was also installed to assess *tear staining* (WEL2BE, TRL 3). This dark discoloration below the inner corner of the eye is a potential indicator of social and environmental stress. At the evisceration line, InnoTech Vision installed the *Lesion-Detect* (TRL 3), a camera-based sensor that assesses lung and liver lesions. On-farm, InnoTech Vision installed two sensors: *Enviro-Detect* (TRL 7), monitoring barn climate (temperature, humidity, ammonia, dust, CO₂), and *Weight-Detect* (TRL 7), assessing pig weight via camera images, alerting farmers to abnormal growth. This system detected the onset of respiratory disease in a batch 6 days before clinical signs appeared.



2.5. Pilot 3 – Duc – Technology implementation in broiler production

Pilot 3 of the aWISH project is led by the broiler slaughterhouse DUC (Plukon Food Group) in Chailley, France, with Itavi as scientific co-lead. Six new technologies were implemented: 3 sensors at the slaughterhouse, 1 sensor and a mobile application on-farm, and 1 sensor for transport. At the gas tunnel exit, WEL2BE installed the *stunning effectiveness sensor* (TRL 3), a camera-based system to detect improperly stunned birds by monitoring movement in the crates. Further along the line, CLK installed *ChickenCheck Footpad* (TRL 9) and *ChickenCheck Hockburn* (TRL 9), camera systems that detect and classify footpad and hockburn lesions. Itavi contributed several technologies, including the *EBroilerTrack Sound* (TRL 5) in the lairage area, which uses microphones to monitor vocalizations as an indicator of acute stress. On-farm, Itavi assesses broiler welfare using the *EBENE application* (TRL 9) and installed the *EbroilerTrack Image* (TRL 5), a camera system tracking individual broiler activity and calculating welfare indicators. Lastly, Itavi developed *Transport Monitoring Sensors*, measuring temperature, humidity and CO₂ in broiler crates during transport.

2.6. Pilot 4 – Plukon – Technology implementation in broiler production

Pilot 4 of the aWISH project is led by the broiler slaughterhouse Plukon in Sieradz, Poland, with IGBZ PAN as scientific co-lead. CLK is responsible for all newly installed technologies in this pilot. Similar to pilot 3, the *ChickenCheck Footpad* (TRL 9) and *ChickenCheck Hockburn* (TRL 9) camera systems detect and classify footpad and hockburn lesions, respectively. Additionally, the *ChickenCheck Catch Damage* (TRL 7) detects catch damage on wings and is being further developed to identify damage on the breast and legs. CLK also implemented the *ChickenCheck Scratch* (TRL 4), which detects scratches on broiler chickens' backs. These four camera systems are installed after the plucking phase, where each chicken is evaluated in real-time. The welfare indicators are summarized statistically and evaluated at the flock level. On-farm welfare assessments are also conducted for selected flocks using the *EBENE app* (TRL 9) from Itavi, as in pilot 3. Due to the overlap in technologies between pilots 3 and 4, they serve as external validators for each other.



2.7. Pilot 5 – Grossfurtner – Technology implementation in pig production

Pilot 5 of the aWISH project is led by the pig slaughterhouse Grossfurtner-Higelsberger GmbH in Austria, with VetMedUni as scientific co-lead. This is a second phase pilot, which means that a selection of the technologies implemented in the other pilots are installed here with one year time difference. The goal of the second phase pilots is to broaden the piloting activities and geographical coverage of the developed aWISH solutions and to provide external validation of developed technologies and data collection procedures. Pilot 5 already installed the CLK *Pig Inspector* (TRL 5), the same automated system that measures the tail length and checks for skin, ear, and tail lesions on pig carcasses as in pilot 1. Additionally, in analogy to pilot 2, WEL2BE will install the *stunning effectiveness technology* for pigs (TRL 5) and the *tear staining sensor* (TRL 3) in pilot 5, starting at second half of 2024.

2.8. Pilot 6 – Carnex – Technology implementation in pig production

Pilot 6 of the aWISH project is led by the pig slaughterhouse Carnex in Vojvodina, Serbia, with BioSense as scientific co-lead. It is also a second phase pilot, validating three technologies already implemented in pilots 1 and 2. FBN will install *STREMODO* (TRL 5) in the lairage area to measure stress vocalizations that can be utilized to optimize procedures and evaluate the effect of changes in the handling of the animals. As in pilot 2, Innotech Vision will install the *Lesion Detect* (TRL 3) at the evisceration line and the *Enviro-detect sensor* (TRL 7) on-farm, providing information on the lung and liver health and barn climate, respectively. Installations are expected to be completed by the end of 2024. Additionally, pilot 6 already features Bit Gear's *Animal Sense technology* (TRL 8). This sensor package does not only measure barn climate (temperature, relative humidity, ammonia concentrations), similar to the *Enviro-detect sensor*, but also the feed level inside the silo and feed consumption. In cooperation with BioSense, the *Animal Sense* will be extended with a sensor to track pig behavior inside the pen.



3. Conclusion and Next Steps

All Practice Abstracts will be submitted to the EU CAP Network, by the end of April 2024, and published on the [Website](#).

An overview of the project will be also submitted, mentioning the main objective of the project: “Develop a cost-efficient solution for evaluating and enhancing the welfare of meat-producing livestock across Europe. This involves automated monitoring of animal welfare indicators throughout the production chain, utilizing existing data and technologies. Piloting in 6 production chains will validate results. Novel sensor tech and AI algorithms will be developed, along with feedback tools for stakeholders. An Indicator Catalogue and Best Practice Guides will disseminate findings.”; and a short summary on the expected findings, “The Development of a cost-efficient solution for evaluating and enhancing livestock welfare through automated monitoring of animal welfare indicators at various stages of the production chain. Piloting and validating results in six broiler chicken and fattening pig production chains across Europe will serve to develop novel sensor technologies and AI algorithms which will help in the implementation of a feedback tool for stakeholders to receive direct feedback and visualize trends. Ultimately, there will be developed a Best Practice Guides to address key welfare issues as well as an Animal Welfare Indicator Catalogue.”.

The second batch of Practice Abstracts is due M48, as part of Deliverable 1.7, to make a total of 24 Practice Abstracts about the aWISH project, and will represent the latest outputs of the project.