Horizon 2020 programme

Call: H2020-SFS-2018-2020 ● Sustainable Food Security

Topic: SFS-08-2018-2019 ● Improving animal welfare

Type of action: RIA

PPILOW

Poultry and Pig Low-input and Organic production systems' Welfare

Start date of the project: September 1st, 2019	**Duration:** 60 months
End date of the project: August 31st, 2024	**Project ID:** 816172

D3.1 - Tools to be used by farmers and by trained observers to assess welfare

Deliverable number	D3.1
Deliverable title	Tools to be used by farmers and by trained observers to assess welfare
Due date of deliverable	31/08/2020 (postponed to 31/10/2020 due to COVID-19)
Actual submission date	31/10/2020
EC version	V0
Lead partner	ITAVI
Author(s)	Laura Warin, Mirjan Thys, Frank Tuyttens
Dissemination level	Confidential, only for members of the consortium (including the Commission Services)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°816172.

Table of content

1. Summary

Objectives:

The aim of this task was twofold:

- The first aim was to make an inventory of practical animal welfare assessment methods, to select or develop the most appropriate methods to be used throughout the project according to the One Welfare concept, and to deliver and distribute among the project participants' guidelines detailing how and when each welfare indicator ought to be measured/scored (to be used in WP4, 5 and 6).
- The second aim was to develop a user-friendly tool for farmers to self-monitor the welfare of their livestock (to be used in Task 3.2).

Rationale:

- **Literature review**

From literature, previous projects (EBENE®, BEEP, Dierenwelzijn Scan, Welfare Quality, KTBL, …) and own expertise, an inventory of potential indicators and tools for assessing the welfare of broiler chickens, laying hens and pigs from the beginning of the production phase until, and including, depopulation was performed between September and October, 2019. Then, this literature review was presented and discussed with the Task 3.1 partners during a physical meeting in Ghent in October, 1st and 2nd.

- **Welfare self-assessment tools for farmers**

The tool selection was decided among Task 3.1 partners based on the availability and adequacy of preliminary tools existing for poultry and pig farming.

To refine the apps, National Practitioner Groups (NPG) were surveyed on the importance and feasibility of the proposed animal welfare indicators in different countries.

Subsequently, on-farm try-outs were conducted in France, Belgium and The Netherlands to assess intuitiveness, comprehensibility and feasibility of both apps.

- **Welfare assessment protocols for trained users**

Guidelines were provided to WP4, 5 and 6 to provide them a set of common measures to be used to assess the welfare of animals during the different experiments.

Teams involved:

EV ILVO, INRAE, ACTA (ITAVI, IFIP), YNCREA HDF, UU, CRA-W

2. Introduction

Standardized tools for farmers to self-assess and benchmark the animal welfare status of the animals on their own farm have been developed. Two smartphone apps are available and downloadable on the Google Play Store and on the App Store. These apps are available in 3 languages (English, French and Dutch) and will be translated in other languages by partners. These apps are linked to 2 different central data storage/processing systems that fulfil requirements of GDPR and give automated feedback to the farmers. This feedback may be in the form of both intra-farm evolution over time and benchmarking (i.e. comparing animal welfare status of the own farm with similar anonymous farms in the database).

Adapted methods to assess animal welfare were also developed and adopted throughout the project for trained observers. This will ensure the homogeneity of measurements throughout the project and on-farm assessment of the impact of selected solutions (WP4-6) for welfare improvement.

3. Results

- **Welfare assessment tools for farmers**

A **summary of the different welfare assessment methods** and their characteristics for poultry and pigs was produced thanks to the information collected during the literature review. This summary is available in the *Appendixes – A. Summary of the literature review.*

This summary was presented and discussed during the meeting in Ghent (1st and 2nd of October, 2019) with Task 3.1 partners. There was a consensus within the Task 3.1 partners to select the following apps:

Pig welfare self-assessment tool – PIGLOW - ILVO APP
A **new PPILOW app** was developed (copying the backbone of the Dierenwelzijn Scan) with multiple languages and operating system (iOS + Android) including assessment of the outdoor area and depopulation indicators for sows and fattening pigs

Poultry welfare self-assessment tool – EBENE® – ITAVI APP
The existing EBENE® app was adapted to include multiple languages and operating system (iOS + Android) including outdoor area and depopulation indicators for broilers and laying hens

These apps will first be **available in 3 languages (French, English and Dutch),** and **downloadable from the App Store and on the Google Play Store from September, 2020**. Further translations will be carried out during the project depending on farmers' interest and translation possibilities by partners. We aim for German, Italian, Romanian, Finnish, and Danish translations of the apps by

2024. These apps are linked to 2 different central data storage/processing systems that fulfil requirements of GDPR. The information forms available when downloading the app and creating an account are presented in the *Appendixes – B.* ***Erreur ! Source du renvoi introuvable.***. These apps also give **automated feedback to the farmers** in the form of both intra-farm evolution over time and benchmarking (i.e. comparing animal welfare status of the own farm with similar anonymous farms in the database). The funding by the European Union Horizon 2020 'Research and Innovation' Programme under Grant Agreement No. 816172 is mentioned in the first screen of both apps.

Briefly, the apps are based on the observation of animals within their farming environment, in accordance with the conceptual framework proposed by the Welfare Quality working group. Four principles were considered to assess welfare: Good feeding, Good housing, Good health and Appropriate behaviour. Criteria were also defined by the Welfare Quality working group to clarify these 4 principles and considered as a framework to build or refine the apps. Indicators were adapted by including inputs from projects reviewed during the first Task 3.1 meetings. Consequently, **the apps consider the expression of appropriate behaviour** (eg enrichment use, foraging), indicators related to **good feeding** (eg aggressive behaviours around feeders), **good health** (eg injuries, skin diseases) and **good housing** (eg available space, resting behaviour, range design). In addition, the **depopulation phase** is also considered into the app (PIGLOW) or in separate web tool (EBENE®). To select the indicators, **preference has been given to animal-based measures**, as these measures are believed to be more directly related to the actual animal welfare status, than resource-based measures.

Screenshots of the apps and of the results are available in the *Appendixes – C.*

Screenshot of the apps.

To ease the use of these apps by farmers, **guidelines were produced to detail how and when each indicator ought to be measured**. These guidelines are available for pig and poultry farmers, in English, French and Dutch. These guidelines are available on the following websites https://www.itavi.asso.fr/content/protocole-ebene-guide-pour-les-utilisateurs and https://www.piglow.eu/Home/Questionnaires. Following the translation of the apps in German, Italian, Romanian, Finnish and Danish, these guidelines will also be progressively translated by partners in these languages (depending on the farmers willingness to test the apps in these countries). Some materials were already translated to train the facilitators and to help them present the apps during the NPG meetings in France, Germany, Belgium, The Netherlands, Denmark and Romania.

To refine the apps, National Practitioner Groups (NPG) were surveyed and feedback was collected in France, Germany, Belgium, The Netherlands, Denmark and Romania. The meeting was cancelled in Italy due to the Corona virus emergency and – hence - no feedback could be collected from the Italian NPG. The survey results were compiled and analysed to identify the most relevant / feasible indicators to add in the apps and to be discussed among Task 3.1 project partners. The test version of the PIGLOW app was built taking into account these responses and the opinion of the scientific experts. The requested improvements for the EBENE® app were asked to the subcontractor taking into account these responses and the opinion of the scientific experts. The NPG survey results and the approach taken during final indicator selection are described in the *Appendixes – E. Feedback from the poultry NPG* and in the *Appendixes – F. Feedback from the pig NPG*.

Subsequently, **on-farm try-outs were conducted to assess intuitiveness, comprehensibility and feasibility of both apps**. Farmers were selected among NPG participants or voluntary ones willing to test the apps. The only condition was to select farmers with broilers, laying hens or pigs with access to an outdoor area. These farmers were visited once. Information and consent forms provided to the farmers are presented in the *Appendixes – G. Information and consent forms for the on-farm visits*. Feedback from 6 farmers was collected: the EBENE® app was tested by 2 broiler farmers (organic and free-range), and 2 laying hen farmers (organic); the PIGLOW app was tested by 2 pig farmers (organic). This number was slightly lower than initially planned (up to ten flocks from different farms for testing the apps) due to the difficulty to travel and lack of availability of farmers in the context of the Coronavirus outbreak. However, it was enough to get detailed feedbacks on both apps and on all the species. Summaries of the feedback received from the farmers after the on-farm visits and the requests from farmers (rewording, ergonomic aspects, methodological aspects) were combined and discussed within Task 3.1 partners based on relevance and feasibility (financial aspects and time required to implement the desired modifications). All these aspects are presented in the *Appendixes – H. Information and consent forms* for the on-farm visits

- **Poultry**

Information form for participants of the welfare self-assessment apps testing

Title of the project: PPILOW 'Poultry and PIg Low-input and Organic production systems' Welfare'

Coordinator: Institut National de Recherche pour l'Agriculture, l'alimentation et l'Environnement (INRAE)

Funding: The PPILOW project aiming at improving the welfare of pigs and poultry in low-input outdoor and organic production systems has received funding from the European Union Horizon 2020 'Research and

Innovation' Programme under Grant Agreement No. 816172. The information provided reflects the views of its authors. The Executive Agency for Research of the European Commission cannot be held responsible for the use of the information provided.

Introduction:

XXX (ITAVI, ILVO or UU) offers to participate in a research project to test on-farm welfare assessment tool for poultry: EBENE®. The demonstration of the EBENE® app will be performed by *XXX (surname and first name, email and telephone, position, affiliation and postal address)(eventually)* eventually assisted by *YYY (Organism, title)*. The legal basis for this project is the performance of a public interest task requiring your consent in accordance with the general European Data Protection Regulation n° 2016/67.
Before deciding to take part in this research project, please take the time to read the following information. You can take the time you need to decide whether or not to participate in this research, for which you are free to agree or refuse to take part. If you do agree you may also choose not to answer all the questions put to you, or at any time stop contributing without having to explain why.

Context of the PPILOW research project:

The purpose of the project is to co-construct, through a multi-actor approach, innovations to improve the welfare of poultry and pigs reared in low-input outdoor and/or organic farming systems. This project gathers 23 contractually-engaged partners (Grant Agreement n°8161172 signed with the European Commission, Consortium Agreement version 2019-04-25 signed among project partners).
To improve welfare level of poultry and pigs on farm, INRAE (former INRA, France) is leading the PPILOW European project on animal welfare in organic and free-range production systems (www.ppilow.eu). Tools were developed or refined for poultry and pig welfare assessment according to practitioners' feedback and we would like to present you the current version of the apps to be sure there is no major remaining issues. The study will be conducted by an international team of researchers from different partner institutes (ILVO, CRAW, ACTA – ITAVI and Universiteit Utrecht) on farms in Belgium, France and The Netherlands. Up to 10 farmers will be surveyed (2 to 3 in each country), once between May and August 2020. If you choose to participate, we thank you for agreeing to give your opinion in the 'PPILOW' project.

The usefulness of the data collected in achieving the aims of this research project:

You will have the possibility to contribute to the improvement of the welfare self-assessment apps by providing us your opinion on it. One on-farm visit will be organized between you and researcher(s) to perform a welfare assessment together (on the researcher smartphone or directly on your smartphone, with a temporary account dedicated to this trial). Then, a few questions will be asked to collect your opinion on e.g. ergonomic aspects, relevance of indicators. Your answers will be taken into account as far as possible to refine the apps after discussions within Ppilow partners and app developers.

Participant selection

We received your contact details from the PPILOW National Practitioners Group based on expressed interest in volunteering to participate in this study.

Information on the EBENE® app:

EBENE® is a tool enabling users (mainly farmers, veterinarians and technicians) to carry out an assessment of the welfare of poultry flocks (chicken, turkey, guinea fowl), layers (ground and/or grazing) or rabbits, based on a methodology developed during successive research programs by the Technical Institute of Poultry.

The tool allows:
- to raise awareness of animal welfare issues among users, in particular poultry and rabbit farmers, as well as persons and companies providing advice to farmers,
- to evaluate the main welfare indicators on farms,
- to monitor the evolution over time of the level of well-being on the same farm,
- to position the results of the well-being indicators of a batch in relation to references,

- to propose ways of improving farming practices in order to further improve the welfare of farmed poultry and rabbits

Your rights regarding confidentiality and privacy:

The private data obtained will be treated with the utmost confidentiality (related to your identity, questionnaire answers and welfare data of your animals). Your identity will be dissociated from your answers, comments, inquiries and EBENE® results and correspondence with your identity will be stored in a specific spreadsheet accessible only by ILVO, CRAW, ACTA – ITAVI and Universiteit Utrecht. The information we will receive from you will be hosted by (*the organism that perform the on farm visit*). Your welfare results won't be stored on the global EBENE® database as a temporary account will be used for this trial (no results will be saved in the database). The summary of your contributions will only be sent to the European partners involved in the EBENE® app refinement without mentioning your identity or means of accessing your personal data. For publications, your identity will be protected and all data will be pseudonymized, however, please be aware that publications may include quotes mentioning your general position in the supply chain (e.g. farmer, adviser). Publication types may include reports to the European Commission and scientific papers. Relevant general outcomes may also be used to promote organic and/or free range poultry productions in specific websites. The private data will not be transmitted to any other recipient, nor used in any context other than that described above. By default, it is prohibited to communicate private data to an undisclosed recipient (except authorized third parties).

This information will be kept, under the best conditions of security and confidentiality, for the entire duration of the research project, i.e. 5 years and the following 5 years, by *XXX and YYY* and will possibly be reused for contacting you for a subsequent project related to the topic, if you consent. At the end of this period, the information collected is intended to be archived, in accordance with the law, in a pseudonymized form, i.e. without any possibility of access to your identity.

Your rights regarding your questions:

You can ask questions about the research project at any time (before, during and after your participation) by contacting *Laura Warin* by email at *warin@itavi.asso.fr (or by phone at +33 2 47 42 78 36)*. In the event of unavailability, you can contact *Frank Tuyttens* at the following address*: frank.tuyttens@ilvo.vlaanderen.be*.

Your right to withdraw from the study at any time:

In accordance with the European Regulation on the protection of personal data and the National Data Protection Act, you have the right to access, rectify, oppose and delete information concerning you. Unless you object, the personal data collected during this research project may be the subject of a subsequent research project with a similar research purpose. If you oppose further use of your data, all of your data (personal and knowledge provided within the group) will be deleted at the end of the project.
If you wish to exercise these rights and/or obtain information about yourself, please contact *XXX (xxx@xxx) or YYY (yyy@yyy) – contact person who conducted the on-farm visit.* Your decision to participate, refuse to participate, or cease participation will not affect future relationships with *(organism(s) involved in the on-farm visit).*

Plausible risks associated with the study:

The results of the studies might be widely disseminated, and it is advised not to communicate on welfare results without prior asking to your contact at ILVO, CRAW, ACTA – ITAVI and Universiteit Utrecht.

Expected benefits of the study:

You will have a feedback of the final improvements of the EBENE® app. Moreover, thanks to this on-farm demonstration, you will be trained to use the EBENE® app to assess the welfare of your poultry alone. If you want to, you may create a user account. This account creation must be done on the EBENE® mobile application. When creating the account, you will be asked to create a login (email address) and define a password. You can also select a company (production organization, veterinary practice, etc...) with which you wish to share your evaluations.

Access to the basic functionalities of the mobile application and website, after creating an account, is free of charge. Access to the paid functionalities is subject to the subscription of a specific license.

In the event of loss or theft of your password, you will inform the Technical Institute of Poultry by sending an email to contact_EBENE@itavi.asso.fr.

If you are willing to be part of the longitudinal study that will take place from September, 2020 on broilers, you will have priority. This study involves the use of the app on several flocks to identify lever of improvements to implement, and to assess their impact on the welfare scores calculated in the EBENE® app. However, we would kindly ask you to select the company "Ppilow Project" when creating your EBENE® account so that the welfare data collected on your animals will be accessible by *ITAVI – Laura Warin and ILVO – Evelien Graat* for research purposes. These welfare data will then be pseudonymised prior any analysis of file sharing with Ppilow project partners. Only the database manager, OnePoint, will have access to your data.

Dissemination:

This research will be disseminated in conferences, meetings with practitioners, videos, e-learning, project website and published in conference proceedings and academic journal articles.

XXX (unit/dpt of the facilitator) is accompanied by the Personal Data Protection Officer (*DPO, if any)* or the person who is responsible for data security and storage of its supervisory institution. His contact details are *Address; Tel: xxxx ; E-mail: xxx@yyy.*

1- Consent form

To guarantee your privacy rights, we ask you to give your explicit consent (tick the corresponding boxes):

		Thanks to tick the box	
		Yes	**No**
1-	I hereby certify that I have read the information on the PPILOW research project mentioned above and that I have obtained the answers to my questions	☐	☐
2-	I have had the necessary time to reflect on my involvement in this study and I am aware that my participation is entirely voluntary	☐	☐
3-	I agree to take part to the on-farm trial to give my opinion on the EBENE® app	☐	☐
4-	I agree to be photographed during the on-farm trial and that my image may be published on the project website or other communication or dissemination means. The pictures will be stored by *XXX (organism)* until 5 years after the end of the project (until August 2029).	☐	☐
5-	I accept that so-called sensitive information concerning my own welfare with regard to that of farmed animals may be collected during the questionnaire	☐	☐
6-	I agree that all the information collected in the context of this group may be published in publications as pseudonymized quotes (without my surname and first name being mentioned).	☐	☐
7-	I agree that my personal data collected through this project may be the subject of a subsequent project to refine or consolidate the research outcomes resulting from this project (excluding any exploitation for commercial purposes), under the same conditions of confidentiality and security.	☐	☐

I have noted that I may withdraw my consent at any time.

Made in two original copies, one of which must be given to the volunteer by hand.

Date:

Name, first name of the project manager:

Mailing address or e-mail address:

Signature:

Name, first name of the volunteer:

Mailing address or e-mail address:

Signature:

➢ Pigs

INFORMATION FORM - Testing and offering feedback on the EBENE® welfare self-assessment app

Project: PPILOW (Poultry and PIg Low-input and Organic production systems' Welfare)

Testing the welfare self-assessment apps

Apps were developed or refined for poultry (EBENE®) and pig (PIGLOW) welfare self-assessment based on existing tool and input from practitioners. The aim of this project task is to allow pig and poultry farmers in Belgium, France and The Netherlands to test the respective app and provide the research team with feedback. If you choose to participate, we thank you for agreeing to give your opinion on the apps.

The usefulness of the collected data in achieving the aims of this research project

You will have the possibility to contribute to the improvement of the welfare self-assessment apps by providing us your opinion on it. One on-farm visit will be organized between you and researcher(s) to perform a welfare assessment together on your smartphone, with a temporary account dedicated to this trial. Then, a few questions will be asked to collect your opinion on user friendliness, feasibility, comprehension and the relevance of indicators. Your feedback will be taken into account as much as possible to refine the apps after discussions with PPILOW partners and app developers.

Participant selection

We received your contact details from the PPILOW National Practitioners Group based on expressed interest in volunteering to participate in this study.

Information on the PIGLOW app

The PIGLOW app was developed by EV ILVO as a welfare self-assessment app for farmers to evaluate the welfare of pigs in organic and free-range systems. The tool primarily includes animal-based indicators (e.g. related to body condition, injuries, free range use). Additionally, key questions on management, housing and production parameters are included for customized/tailored benchmarking. After online submission of a completed scan, the farmer will receive instant automated feedback. This feedback report includes potential risk factors for identified problems, comparison with past scanning results to illustrate evolution in time, and anonymous benchmarking with comparable farms (as soon as enough data is available in the data base).

Your rights regarding confidentiality and privacy

The private data obtained will be treated with the utmost confidentiality (related to your identity, feedback and welfare data of your animals). For the testing of the PIGLOW app, only an e-mail address will be collected. This is required to create an account for the app.

After uploading the data you collected via the PIGLOW app, your e-mail address will automatically be replaced by a unique artificial identifier (or pseudonym) prior to data processing and analysis. No e-mail addresses will – hence – be stored in the data base. All data that is collected in the PIGLOW app during the test phase will not be used for analysis and will be deleted from the database. Only the feedback you provide on the app will be processed and be used to improve the app.

However, please be aware that publications may include quotes mentioning your general position in the supply chain (e.g. farmer, adviser). Publication types may include reports to the European Commission and scientific papers. Relevant general outcomes may also be used to promote organic and/or free range poultry productions in specific websites. The private data will not be transmitted to any other recipient, nor used in any context other than that described above. By default, it is prohibited to communicate private data to an undisclosed recipient (except authorized third parties).

This information will be kept, under the best conditions of security and confidentiality, for the entire duration of the research project, i.e. 5 years, and the following 5 years and will possibly be reused for contacting you for a subsequent project related to the topic, if you consent. At the end of this period, the information collected is intended to be archived, in accordance with the law, in a pseudonymized form, i.e. without any possibility of access to your identity.

Your right to withdraw from the trial at any time
If you agree to participate you may still choose not to answer all the questions put to you, or at any time stop contributing without having to explain why. In accordance with the European Regulation on the protection of personal data and the National Data Protection Act, you have the right to access, rectify, oppose and delete information concerning you. Unless you object, the personal data collected during this research project may be the subject of a subsequent research project with a similar research purpose. If you oppose further use of your data, all of your data (personal and knowledge provided within the group) will be deleted at the end of the project. If you wish to exercise these rights and/or obtain information about yourself, please contact Evelien.Graat@ilvo.vlaanderen.be. Your decision to participate, refuse to participate, or cease participation will not affect future relationships with names of PPILOW partners.

Expected benefits of testing the app
You will receive information on the final improvements of the PIGLOW app. Moreover, thanks to the on-farm demonstration, you will be trained to use the PIGLOW app to assess the welfare of your pigs by yourself. Finally, if you want to be part of the longitudinal study that will take place from September 2020, you will have priority.
This longitudinal study aims to test how effective animal welfare self-assessment via a mobile application by farmers combined with automated feedback, including anonymous benchmarking, is in improving the welfare of animals in commercial organic and low input broiler chicken and pig production systems.
In addition, we will be testing agreement in scoring of animal welfare measures between farmers and trained researchers, and we will be collecting data for the central data base that will be useful for researchers and the farming sector for documenting main animal welfare issues in low-input farming systems and for identifying differences in time or between systems.
The study will be conducted by an international team of researchers from different partner institutes (ILVO, CRA-W, BioForum, ACTA - ITAVI, Universiteit Utrecht and INRA) on farms in Belgium, The Netherlands and France.

Dissemination
This research will be disseminated in conferences, meetings with practitioners, videos, e-learning, project website and published in conference proceedings and academic journal articles.
XXX (unit/dpt of the facilitator) is accompanied by the Personal Data Protection Officer (*DPO, if any)* or the person who is responsible for data security and storage of its supervisory institution. His contact details are *Address; Tel: xxxx ; E-mail: xxx@yyy.*

In case you have any further questions on the research in the future, you can contact me.

Sincerely,
Name Researcher

4. Consent form

To guarantee your privacy rights, we ask you to give your explicit consent (tick the corresponding boxes):

		Yes	No
1-	I hereby certify that I have read the information on the PPILOW research project mentioned above and that I have obtained the answers to my questions	☐	☐
2-	I have had the necessary time to reflect on my involvement in this study and I am aware that my participation is entirely voluntary	☐	☐
3-	I agree to take part in the on-farm trial to give my opinion on the EBENE® app	☐	☐
4-	I agree to be photographed during the on-farm trial and that my image may be published on the project website or other communication or dissemination means. The pictures will be stored by *XXX (organism)* until 5 years after the end of the project (until August 2029).	☐	☐
5-	I accept that so-called sensitive information concerning my own welfare with regard to that of farmed animals may be collected during the questionnaire	☐	☐
6-	I agree that all the information collected in the context of this group may be published in publications as pseudonymized quotes (without my surname and first name being mentioned).	☐	☐
7-	I agree that my personal data collected through this project may be the subject of a subsequent project to refine or consolidate the research outcomes resulting from this project (excluding any exploitation for commercial purposes), under the same conditions of confidentiality and security.	☐	☐

I have noted that I may withdraw my consent at any time.

Made in two original copies, one of which must be given to the volunteer by hand.

Date:

Name, first name of the researcher:

Mailing address or e-mail address:

Signature:

Name, first name of the volunteer:

Mailing address or e-mail address:

Signature:

Feedback from the farmers.

- **Welfare assessment protocols for trained users**

A minimum set of indicators and associated measurement methods were defined for project partners. Partners are of course still free to add other observations linked to their experimental design and depending on the research objectives.

To meet experimental needs, an Excel sheet was filled out by partners from WP4, 5 and 6 to have an overview of the objective of the studies, experimental design and number of involved animals. This file is presented in the *Appendixes – I.*

Summary of the experimental and on-farm trial. Moreover, several discussions were carried out with WP5 partners as their experiments were already on-going and the need for these welfare protocol was quite urgent (e-mail exchanges, Skype meetings).

The guidelines to assess the welfare of broilers and laying hens are presented in *Appendixes – J. Poultry welfare assessment protocols for trained users*.

The guidelines to assess the welfare of pigs are presented in *Appendixes – K. Pig welfare assessment protocols for trained users.*

The **project-use indicators are similar to the ones included in the self-assessment tools** (EBENE® and PIGLOW). Some self-assessment indicators were not relevant for project-use and were therefore removed (eg: indicators linked to feeders or drinkers availability are not relevant for on-station experiments). To clarify the differences between the apps (PIGLOW and EBENE®) and the project-use tools, an Excel sheet is presented in *Appendixes – L. Welfare assessment guidelines for fattening pigs*

These are guidelines for general welfare assessments of fattening pigs (pigs from weaning up to slaughter). You are free to adapt them by adding additional indicators that are relevant for your experiment or by applying changes to the assessment method to better fit your experimental protocol.

Recommendations for the number of animals to assess

For indicators measured on an individual level:

- If there are < 50 animals per treatment group, assess all animals
- If there are > 50 animals per treatment group, assess at least 50 animals, but preferably as many as possible

For indicators measured on a group level:

- Assess at least 6 groups, but assess all groups if possible

Recommendation for the scoring method

We recommend to score the indicators for which it is possible/relevant to rate the severity on a continuous scale. This can be done on a tagged visual analogue scale or by scoring on a large range of numbers (for example 0 to 100). By marking the visual analogue scale with the numbers 0 to 100, the two types of scales become effectively the same (see figure 1).

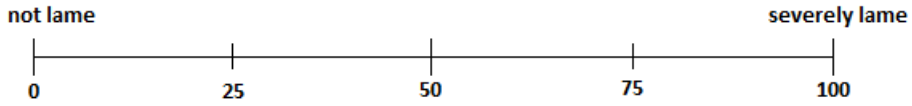


Figure 1: Visual analogue scale (VAS)

Welfare assessment

We recommend to perform the assessment at a time-point when all animals have been in the same group for at least 14 days to avoid an effect of social tension on the welfare indicators that are measured.

However, if the early phase after forming new groups is especially relevant to your experiment, please do perform the welfare assessment within these 14 days.

We also advice to start the assessment at least one hour after feeding (unless the animals are fed ad libitum) to avoid any influence of feeding time.

Indicators to be measured on an individual level

- Cleanliness/covered with faeces
  - Score the percentage of the skin surface on one side of the body that is covered with faeces (score between 0 and 100)
  - Note that this parameter should not be confused with dirtiness: an outdoor pig soiled with mud (on a warm day) is normal, and does not necessarily indicate a welfare problem.
- Panting
  - Score on a continuous scale from 0 to 100
  - 0 = normal breathing
  - 33 = breaths are slightly more rapid and shallow
  - 67 = breaths are clearly rapid and shallow, and faster chest movements can be seen
  - 100 = breaths are very short and shallow, and the chest is moving rapidly
- Shivering
  - Yes | no
- Too small
  - The animal is 1/3 smaller than the average pig in the same group
  - Yes/no
- Bad general state
  - This indicator is meant to pick up on animals that show general signs of sickness or otherwise compromised health. Examples of such signs are animals which are obviously in pain, sick, needing further care to avoid complications, dull or apathic, isolated from the group, with dull/sunken eyes, blue/red ears or snout, pale skin colour, rapid respiration
  - Yes | no
- Hernia
  - Score on a continuous scale from 0 to 100
  - 0 = no hernia
  - 25 = small protrusion, no bleeding
  - 50 = small bleeding protrusion or medium size but not bleeding
  - 75 = medium size and bleeding protrusion or a large protrusion (bigger than the distance between hernia and floor) that is not bleeding
  - 100 = hernia is much bigger than the distance between the hernia and the floor and bleeding
- Lameness
  - Score on a continuous scale from 0 to 100
  - 0 = no lameness
  - 25 = stiffness of one the legs while walking
  - 50 = the animal can walk, but weight baring on one of the legs is significantly reduced
  - 75 = the animal has clear difficulty walking and puts almost no weight on the affected leg
  - 100 = lameness is so severe that the animal cannot stand upright
- Laboured breathing
  - Score on a continuous scale from 0 to 100
  - 0 = normal breathing
  - 25 = breathing is slightly more heavy than normal
  - 50 = breathing clearly sounds more heavy than normal
  - 75 = more laboured breathing and more pronounced movements of the chest

    - 100 = very heavy breathing (pumping) and laboured movements of the chest with each breath
- Scratches
    - Only thin, shallow marks are considered as scratches. Anything deeper or larger is considered to be a skin wound.
    - Count the number of scratches on one side of the body
- Skin wounds
    - Score the wounds on one side of the body on a continuous scale from 0 to 100
    - 0 = no skin wounds
    - 25 = several small (<2cm), shallow wounds that are healed
    - 50 = several small wounds that are open/bleeding, several medium size (2-5cm) wounds that are healed
    - 75 = several medium size wounds that are open/bleeding, several large (>5cm) wounds that are healed
    - 100 = several large, deep wounds that are bleeding
- Skin irritation
    - Score on a continuous scale from 0 to 100
    - 0 = normal skin
    - 25 = mild local skin inflammation or mild red spots (<10% of body surface)
    - 50 = larger area of mildly inflamed/spotted skin (>10%) or a small but clearly inflamed/spotted zone
    - 75 = a large area of the skin that is clearly inflamed/spotted
    - 100 = severely inflamed skin or dark spots over a large area of the skin or less severe inflammation/spots over a much larger area (>30%)
- Ear lesions
    - Score on a continuous scale from 0 to 100
    - 0 = no ear lesions
    - 25 = only small scabs or scratch-like lesions are visible
    - 50 = there are bigger crusts on the ears or small lesions with dried blood
    - 75 = there are big crusts on the ears and/or bleeding lesions
    - 100 = ears are severely damaged by lesions and there are fresh, bleeding lesions
- Tail lesions
    - Score on a continuous scale from 0 to 100
    - 0 = no tail lesions
    - 25 = only small, minor lesions without blood
    - 50 = slightly bigger lesions with some swelling or dried blood
    - 75 = open wounds, significant swelling or fresh blood
    - 100 = open wounds, significant swelling and fresh blood

Indicators to be measured on a group level

- Note how many animals are in the group that you observe
- Huddling
    - Assess the percentage of animals in the group that is huddling, divided into categories
    - <20% of pigs | 20%-50% of pigs | >50% of pigs
- Lying position
    - Assess the number or percentage of animals in the group that is lying in each of these three positions
    - Sternal position = Lying on the belly with all four legs tugged under the body
    - Half-sternal position = Lying on the belly with the hind legs folded under the body and the front legs extended towards the front
    - Lateral position = Lying on one flank with all four legs extended

    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead
- Liquid faeces in the pen
    - Assess the relative amount of faeces visible in the pen that are liquid, divided into categories
    - No liquid faeces | Some liquid faeces | More than half of all faeces | All visible faeces are liquid
- Enrichment use
    - Count the number of pigs in the group that are currently using enrichment
    - Examples of types of enrichment: straw - roughage | fixed wood | loose wood | burlap sack | chain | fixed toys (by chain or bar) | loose toys | soil | pasture (grass) | wallow
    - If you find it difficult to determine what counts as using enrichment, you could also choose to count the number of animals showing certain behaviours associated with an enriched environment, e.g. object play, exploratory behaviour or playing in mud/soil
- Confidence in humans
    - Before starting this test, you need to enter and walk around the pen to ensure that all animals have noticed you. Do not start the timer until you are standing still.
    - Record the time (in seconds) it requires before the first pig approaches and touches you (after entering the pen). If no pig touches you within 120 seconds, end the test and continue with the next question.
- Sneezing or coughing
    - At the end of each group assessment, note whether you heard/saw any coughing or sneezing in the group
    - Yes | No

Indicators to be measured on farm level

- Signs of sunburn
    - Note whether you observe any pigs with signs of sunburn at any point during the year Signs of sunburn are reddening, oedema and possibly scabs and peeling of the skin
    - Yes | No
- Range use
    - Note whether there are any parts of the outdoor area that are never/rarely used
    - Yes | No

Welfare assessment guidelines for sows

These are guidelines for general welfare assessments of sows. You are free to adapt them by adding additional indicators that are relevant for your experiment or by applying changes to the assessment method to better fit your experimental protocol.

Recommendations for the number of animals to assess

For indicators measured on an individual level:

- If there are < 50 animals per treatment group, assess all animals
- If there are > 50 animals per treatment group, assess at least 50 animals, but preferably as many as possible

For indicators measured on a group level (if the sows are group housed):

- Assess at least 6 groups, but assess all groups if possible

Recommendation for the scoring method

We recommend to score the indicators for which it is possible/relevant to rate the severity on a continuous scale. This can be done on a tagged visual analogue scale or by scoring on a large range of numbers (for example 0 to 100). By marking the visual analogue scale with the numbers 0 to 100, the two types of scales become effectively the same (see figure 1).

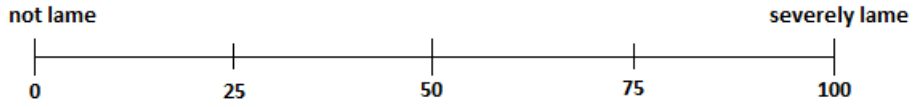


Figure 1: Visual analogue scale (VAS)

Welfare assessment

If the sows are group housed, we recommend to perform the assessment at a time-point when all animals have been in the same group for at least 14 days to avoid an effect of social tension on the welfare indicators that are measured. However, if the early phase after forming new groups is especially relevant to your experiment, please do perform the welfare assessment within these 14 days.

We also advice to start the assessment at least one hour after feeding (unless the animals are fed ad libitum) to avoid any influence of feeding time.

Indicators to be measured on an individual level

- Cleanliness/covered with faeces
    - Score the percentage of the skin surface on one side of the body that is covered with faeces (score between 0 and 100)
    - Note that this parameter should not be confused with dirtiness: an outdoor pig soiled with mud (on a warm day) is normal, and does not necessarily indicate a welfare problem.
- Panting
    - Score on a continuous scale from 0 to 100
    - 0 = normal breathing
    - 33 = breaths are slightly more rapid and shallow
    - 67 = breaths are clearly rapid and shallow, and faster chest movements can be seen
    - 100 = breaths are very short and shallow, and the chest is moving rapidly

- Shivering
    - Yes | no
- Body condition: for body condition we advise to measure “too fat” and “too lean” on separate scales of 0 to 100, as the two condition indicate opposite welfare problems. When scoring “too fat”, a score of 0 can mean both a perfectly normal condition or that the sow is too lean, and the opposite for scoring “too lean”.
    1. Too fat
        - View the sow from behind and palpate if possible
        - Score on a continuous scale from 0 to 100. 0 = normal body condition (with firm pressure, the hip bones and back bone can be felt) or too lean
        - 50 = no hip bones or vertebrae are visible, flanks are slightly rounded, small folds of fat are visible on the thighs and near the base of the tail
        - 100 = hip bones and back bone cannot be felt even with strong pressure and big folds of fat are visible around the thighs
    2. Too lean
        - View the sow from behind and palpate if possible
        - Score on a continuous scale from 0 to 100
        - 0 = normal body condition (the hip bones and back bone can be felt when applying firm pressure with the hand) or too fat
        - 50 = hip bones can easily be felt without applying pressure, flanks are slightly sunken, some individual vertebrae are visible
        - 100 = hip bones and back bone are clearly visible, flanks are clearly sunken and some ribs are visible
- Bad general state
    - Yes | no
    - This indicator is meant to pick up on animals that show general signs of sickness or otherwise compromised health. Examples of such signs are animals which are obviously in pain, sick, needing further care to avoid complications, dull or apathic, isolated from the group, with dull/sunken eyes, blue/red ears or snout, pale skin colour, rapid respiration
- Hernia
    - Score on a continuous scale from 0 to 100
    - 0 = no hernia
    - 25 = small protrusion, no bleeding
    - 50 = small bleeding protrusion or medium size but not bleeding
    - 75 = medium size and bleeding protrusion or a large protrusion (bigger than the distance between hernia and floor) that is not bleeding
    - 100 = hernia is much bigger than the distance between the hernia and the floor and bleeding
- Lameness
    - Score on a continuous scale from 0 to 100
    - 0 = no lameness
    - 25 = stiffness of one the legs while walking
    - 50 = the animal can walk, but weight baring on one of the legs is significantly reduced
    - 75 = the animal has clear difficulty walking and puts almost no weight on the affected leg
    - 100 = lameness is so severe that the animal cannot stand upright
- Laboured breathing
    - Score on a continuous scale from 0 to 100
    - 0 = normal breathing
    - 25 = breathing is slightly more heavy than normal
    - 50 = breathing clearly sounds more heavy than normal
    - 75 = more laboured breathing and more pronounced movements of the chest

  - 100 = very heavy breathing (pumping) and laboured movements of the chest with each breath
- Bursitis
  - A fluid filled swelling of the knee or hock region
  - Score on a continuous scale from 0 to 100: one combined score for the front and hind limb on one side
  - 0 = no swelling
  - 25 = a small bursa (<2cm)
  - 50 = multiple small bursa or a medium size bursa (3-5cm)
  - 75 = several medium size bursae or a large bursa (>5cm)
  - 100 = very large bursa (>8cm), bursa with a wound or several large bursae
- Shoulder lesions
  - Score on a continuous scale from 0 to 100 for the most severely affected shoulder
  - 0 = no shoulder lesions
  - 25 = a small, healed injury or reddening of the area without skin penetration
  - 50 = a large healed injury or a small but fresh lesion
  - 75 = a large lesion with dried blood or medium size lesion that is bleeding
  - 100 = a large, bleeding injury
- Prolapse
  - Protrusions of the rectum, bladder, vagina or uterus
  - Note whether the sow has a prolapse and of which organ
  - No | Rectum | Bladder | Vagina | Uterus
- Lesions on teats (only for farrowing sows)
  - Score on a continuous scale from 0 to 100
  - 0 = no lesions
  - 25 = a maximum of 3 nipples with lesions, no dried or fresh blood
  - 50 = fresh lesions on more than 3 nipples, no injured teats
  - 75 = healing lesions of several teats
  - 100 = several injured and bleeding teats
- Mastitis (only for farrowing sows)
  - Mastitis is inflammation of the udder which causes the udder to look red and swollen
  - Observe from a distance and note whether the sow has mastitis
  - Yes | No
  - If relevant to your experiment, you can palpate the udder to score in more detail and determine if it feels hard and hot
- Abnormal vaginal discharge
  - Note whether the sow has abnormal vaginal discharge
  - Yes | No
- Vulva lesions
  - Score on a continuous scale from 0 to 100
  - 0 = no lesions
  - 25 = a small (<2cm) scab or healing lesion
  - 50 = healing lesions of 2-5cm
  - 75 = fresh, bleeding lesion of <5cm or healing lesion of >5cm
  - 100 = a large (>5cm) bleeding lesion
- Scratches
  - Count the number of scratches on one side of the body
  - Only thin, shallow marks are considered as scratches. Anything deeper or larger is considered to be a skin wound
- Skin wounds
  - Score the wounds on one side of the body on a continuous scale from 0 to 100
  - 0 = no skin wounds

  - 25 = several small (<2cm), shallow wounds that are healed
  - 50 = several small wounds that are open/bleeding, several medium size (2-5cm) wounds that are healed
  - 75 = several medium size wounds that are open/bleeding, several large (>5cm) wounds that are healed
  - 100 = several large, deep wounds that are bleeding
- Skin irritation
  - Score on a continuous scale from 0 to 100
  - 0 = normal skin
  - 25 = mild local skin inflammation or mild red spots (<10% of body surface)
  - 50 = larger area of mildly inflamed/spotted skin (>10%) or a small but clearly inflamed/spotted zone
  - 75 = a large area of the skin that is clearly inflamed/spotted
  - 100 = severely inflamed skin or dark spots over a large area of the skin or less severe inflammation/spots over a much larger area (>30%)
- Ear lesions
  - Score on a continuous scale from 0 to 100
  - 0 = no ear lesions
  - 25 = only small scabs or scratch-like lesions are visible
  - 50 = there are bigger crusts on the ears or small lesions with dried blood
  - 75 = there are big crusts on the ears and/or bleeding lesions
  - 100 = ears are severely damaged by lesions and there are fresh, bleeding lesions
- Tail lesions
  - Score on a continuous scale from 0 to 100
  - 0 = no tail lesions
  - 25 = only small, minor lesions without blood
  - 50 = slightly bigger lesions with some swelling or dried blood
  - 75 = open wounds, significant swelling or fresh blood
  - 100 = open wounds, significant swelling and fresh blood
- Frothy saliva
  - Note whether the sow has frothy/foaming saliva
  - Yes | No
- Confidence in humans (only for pregnant sows)
  - Calmly enter the pen and walk around to ensure the sows observed your presence. The test consists of 3 steps (each of 10 seconds):
  - 1) walk towards the front side of the sow and stop at approximately 50 cm to 1 m
    2) squat in front of the sow
    3) try to touch the sow between its ears
    To know which score to assign, see the **image** below.
  - This can also be tested on group level if this fits better with the housing arrangements (see guidelines for fattening pigs)

Indicators to be measured on a group level (if animals are housed in groups)

Some of these indicators can be assessed on an individual level if the animals are not housed in groups.

- Note how many animals are in the group that you observe
- Huddling
    - Assess the percentage of animals in the group that is huddling, divided into categories
    - <20% of pigs | 20% -50% of pigs | >50% of pigs
    - If the animals are not housed in groups, this indicator cannot be measured
- Lying position
    - Assess the number or percentage of animals in the group that is lying in each of these three positions
    - Sternal position = Lying on the belly with all four legs tugged under the body
    - Half-sternal position = Lying on the belly with the hind legs folded under the body and the front legs extended towards the front
    - Lateral position = Lying on one flank with all four legs extended
    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead
- Enrichment use
    - Count the number of sows using enrichment
    - Examples of types of enrichment: straw - roughage | fixed wood | loose wood | burlap sack | chain | fixed toys (by chain or bar) | loose toys | soil | pasture (grass) | wallow
    - If you find it difficult to determine what counts as using enrichment, you could also choose to count the number of animals showing certain behaviours associated with an enriched environment, e.g. object play, exploratory behaviour or playing in mud/soil
    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead as a yes/no question
- Liquid faeces in the pen
    - Assess the relative amount of faeces visible in the pen that are liquid, divided into categories
    - No liquid faeces | Some liquid faeces | More than half of all faeces | All visible faeces are liquid
    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead
- Sneezing or coughing
    - At the end of each group assessment, note whether you heard/saw any coughing or sneezing in the group
    - Yes | No
    - If the animals are not housed in groups, the indicator can be assessed at the end of each individual observation instead

Indicators to be measured on farm level

- Signs of sunburn
    - Note whether you observe any pigs with signs of sunburn at any point during the year Signs of sunburn are reddening, oedema and possibly scabs and peeling of the skin
    - Yes | No
- Range use
    - Note whether there are any parts of the outdoor area that are never/rarely used
    - Yes | No

Welfare assessment protocol for piglets

These are guidelines for general welfare assessments of piglets. You are free to adapt them by adding additional indicators that are relevant for your experiment or by applying changes to the assessment method to better fit your experimental protocol.

It is advised to combine the assessment of a litter of piglets with the individual assessment of the sow. Thus the number of observed litters of piglets will be the same as the number of individually observed sows.

Indicators to be measured on a group level

If you have a large number of litters to score, you can choose to simplify the scoring method. Instead of counting the number of piglets in the litter that is positive for a certain indicator, you can state whether at least one of the piglets in the litter is positive for the indicator Yes/No.

- Note the number of piglets in the litter
- Huddling
  - Assess the percentage of animals in the group that is huddling, divided into categories
  - <20% of piglets | 20%-50% of piglets | >50% of piglets
- Panting
  - Count the number of piglets that are panting
- Shivering
  - Count the number of piglets that are shivering
- Cleanliness/covered with faeces
  - Count the number of piglets that are covered with faeces over at least 20% of the skin surface on one side of the body
- Playful behaviour
  - Count the number of piglets that are showing playful behaviour
- Non-vital, weak, sick
  - Count the number of piglets that look non-vital, weak or sick
- Neurological disorders
  - Signs of neurological disorders include muscle tremors and/or paddling of the limbs
  - Count the number of piglets with signs of neurological disorders
- Splay legs
  - Partial paralysis of hind limbs, resulting in inability to stand and the hind limbs being spread (splayed) apart
  - Count the number of piglets with splay legs
- Skin lesions snout
  - Count the number of piglets with skin lesions on the snout
- Skin lesions front legs
  - Count the number of piglets with skin lesions on the front legs
- Laboured breathing
  - Count the number of piglets that display laboured breathing
- Sneezing/coughing
  - Note whether you heard any of the piglets cough or sneeze during the assessment
  - Yes | No

Advice for frequency and timing of assessment

This advice can be followed if you do not have your own ideas about a suitable number and timing of welfare assessments. If another frequency or moment in time is relevant for your experiments, or you do not have a lot of man power, feel free to adapt.

T4.3: fattening pigs, group housed
Advice: at least 2 assessments per year in different seasons

T6.3: 30 sows, housed in groups of 10 during pregnancy and individually after farrowing. Assessment of sows, their piglets and the weaned piglets/fattening pigs until 4-6 months of age.
Advice: one assessment of pregnant sows, one of the farrowing sows with their piglets and one of the pig(let)s after weaning for each batch

T6.4.1: 48 sows for G1 and for G2, each in 4 batches of 12. Sows are individually housed with their piglets.
Advice: one assessment of pregnant sows and one of the farrowing sows with their piglets for each batch

T6.4.2: 12 sows per round with piglets, 6-8 batches
Advice: one assessment during pregnancy and one after farrowing of the sow with her piglets for each batch.

Timing of the assessments
Fattening pigs: approximately 3 weeks after weaning
Pregnant sows: approximately 4 weeks after insemination
Sows with piglets: approximately 2 weeks after birth. If the piglets are weaned at a late age, it could be useful to do a second welfare assessment closer to weaning.

Comparisons between EBENE and project-use tool indicators for poultry welfare assessment which summarises all the indicators that are used in these methods.

5. Conclusion

The PIGLOW and EBENE® apps were developed or extended during the first 12 months of the project. These apps will be used in task 3.2 in Belgium, France and The Netherlands by broiler and pig farmers during 2 years. The aim of this task is to test how effective animal welfare self-assessments by the farmers combined with personalised feedback (benchmarking) is in improving the welfare of animals in commercial organic and low input production systems.

Partners involved in trials (WP4, 5 and 6) will also follow our advice for experimental and on-farm welfare assessments to collect a minimum set of welfare indicators to feed the Animal pillar of the subsequent multi criteria analyses performed in WP7. These indicators will be complementary to the ones related to human welfare developed in task 3.3 of WP3, as well as environmental and economic indicators, in order to assess the sustainability of the levers tested in PPILOW according to the One welfare concept.

6. Annex

A. Summary of the literature review

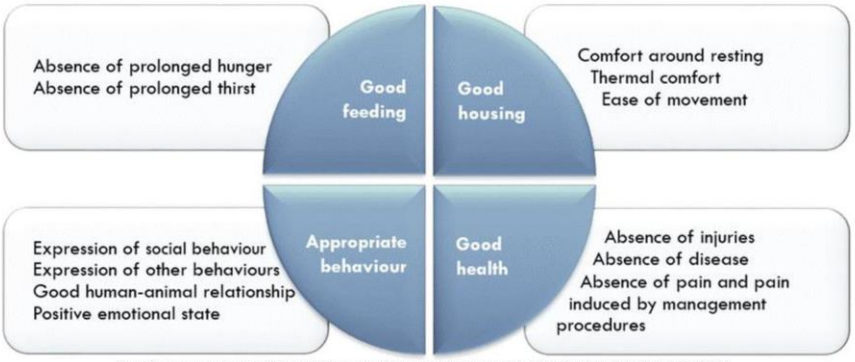
Literature review: Welfare assessment tools

- **What is animal welfare?**
  - "The welfare of an animal is its **positive mental and physical state** as related to the fulfilment of its **physiological and behavioural needs** in addition to its expectations. This state can vary depending on the animal's perception of a given situation." ANSES, 2018
  - Our tool should cover the different dimensions of animal welfare

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Literature review: Welfare assessment tools

- **Conceptual framework proposal: Welfare Quality grid**
  - Same principles and criteria but adapted indicators



https://www.researchgate.net/figure/Welfare-principles-and-criteria-according-to-Welfare-QualityR_fig1_279953184

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Broilers

EBENE	DIERENWELZIJN SCAN	AWIN	KTBL
Self-assessment tool for farmers developed through a participative approach Species: broilers, turkeys, guinea fowls, quails, laying hens, rabbits	**Self-assessment** tool for farmers Species: broilers, laying hens, pigs, cattle	**Self-assessment** tool with special emphasis on pain indicators Species: small ruminants, equidae and turkeys _ adapted for broilers	**Self assessment** tool for farmers developed with farmers, vets, scientists Species: broilers, laying hens, turkeys, pigs, cattle

WELFARE QUALITY	FREEDOM FOOD SCHEME RSPCA	ASSUREWEL
Overall welfare assessment Species: poultry (laying hens, broilers), pigs, cattle	Protocol for experimental use to determine the level of welfare of a breed compared to JA757 Species: broilers, turkeys, ducks, laying hens, pigs, cattle, sheep, fish	Overall welfare assessment for certification schemes Species: broilers, laying hens, pigs, cattle, sheep

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Broilers

Method	EBENE	DIERENWELZIJN SCAN	AWIN	KTBL	WELFARE QUALITY	FREEDOM FOOD SCHEME RSPCA	ASSUREWEL
Outdoor use indicators	Behavioural observations and range description			?	Cover on the range, free-range use		
Depopulation indicators				Rejections, animals injured at the slaughterhouse, DOA	Slaughter plant: crates density, wing damage, bruising, non feeding period	Slaughter plant : DOA, rejections, downgrades, breast blisters, scratches	Slaughter plant : DOA, rejections, breast blisters, wing damage, leg damage
List of ABM	**Sanitary**: lame, dirtiness, mortality, small, wounds, immobile, dead, other abnormality **Behaviour**: Bird distribution, panting, Resting, stretching, agressive pecking, social interaction, foraging, dustbathing, preening, human/animal relation, panic reaction	**Sanitary**: Locomotion, Immobility, Foot (pad) lesions, Breast: cleanliness & blisters, Hock burns, Respiratory symptoms (sneezing, coughing, nasal or ocular discharge, ...), Abnormal faeces, Mortality **Behaviour**: Panting, Use of enrichment, Competition for drinking	**Sanitary**: lame, dirtiness, small, featherless, head/back/tail wounds, immobility, sick, terminally ill, dead **Behaviour**: aggression towards mate, mating	**Sanitary**: Lame, mortality, small, dermatitis / scratch, dehydrated, hock burn, foot pad dermatitis	**Sanitary**: lame, plumage cleanliness, mortality, hock burn, foot pad **Behaviour**: panting, huddling, avoidance distance test, qualitative behaviour assessment	**Sanitary**: walking ability, leg straightness, breast plumage dirtiness, mortality, feather cover, pododermatitis, hock burn **Behaviour**: video recordings for general behaviour and activity	**Sanitary**: Walking ability, Birds requiring culling, Runts & dead, Pododermatitis, Hock burn **Behaviour**: Bird distribution, Panting, Enrichment use, global behaviour
List of RBM	Feeders and drinkers availability, Litter quality, Perches availability, available space, range type, on-farm culling method, other intervention (beak trimming, ...), farmer's practices, enrichment availability	Stocking density, availability of free-range / covered outdoor range, enrichment availability	Farm manager questionnaire (not used for welfare assessment in itself: density, feed/water consumption, ...)	Water consumption, ATB consumption?, weight ?	Drinker space, litter quality, dust sheet test, stocking density, cover on the range, free range use (estimation of the nb of birds on the range), culls on farm	ATB use	Air quality, Mortality & Culls, Antibiotic records, Post-slaughter records

- List of essential indicators, of indicators to be submitted to NPGs & of indicators to be studied more in depth

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare self assessment tools_ Broilers EBENE

Principles	Criteria	Ressource based indicators	Animal based indicators
Good feeding pratices	Appropriate feeding	Feeders availability	Small
	Appropriate drinking	Drinkers availability	
Good environment	Rest comfort	Perch availability, litter quality	Dirtiness, resting
	Environment comfort		Panting, animal distribution
	Movement capacity	Available space, outdoor range acess and type	Stretching or wing flapping
Good health	Prevention of injuries and treatment		Injury, lame
	Prevention of diseases enad treatment		Immobile, other anomaly, mortality
	Good intervention practices	Culling method, other interventions (beak trimming…)	
Appropriate behaviours	Group behaviour		Aggressive pecking, social interaction
	Natural behaviour		Foraging, dustbathing, preening
	Human-animal relationship	Farmer practices	Human-animal relation, dead
	Prevention of stress and fear	Enrichment	Panic

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare self assessment tools_ Broilers EBENE

- **Method:**
  - Transect for sanitary observations (2)
  - Animal sampling for behavioural observations (3 areas – 5mns observations)
  - No handling

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare self assessment tools_ Broilers DIERENWELZIJN SCAN

- **Mobile application** ⟶ offline data recording
- **Website** ⟶ online platform (www.dierenwelzijnscan.be)
  - potential risk factors
  - past scanning results
  - anonymous benchmarking

Google Play (Android)

- **Animal Welfare Indicators**
  - animal-based '*outcome*' indicators
  - allowing straightforward scoring (self-scan!)
  - limited but instructive number of animals
  - time-span of about 1.5 – 2 h

App Store (iOS)

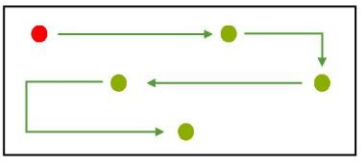
- **Feedback after online submission of completed scan**
  - report automatically generated calculating scores for each key welfare indicator (0-100 scale)
  - scores depicted over time & benchmarked anonymously

PPILOW Kick-off meeting, 4th – 6th September 2019, Paris, France

BOERENBOND trouw aan land- en tuinbouw

Welfare self assessment tools_ Broilers DIERENWELZIJN SCAN

- **Method:**
  - Transects
  - 5 stops with group and individual screening (3 birds per stop)
  - Handling
  - Indicators: see overview table (slide 12)



PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

BOERENBOND trouw aan land- en tuinbouw

Welfare assessment tools_ Broilers OTHERS

- **AWIN:**
  - Transects
  - No handling
- **KTBL:**
  - Animal sampling - Handling
- **WELFARE QUALITY:**
  - Observation at different locations (4 to 8 locations) – 100 birds up to 5 locations (panting, huddling), 100 birds picked up (10 birds, 10 locations – plumage cleanliness)
  - Handling
- **RSPCA:**
  - All birds assessed for walking ability
  - Sampling 25 birds for the other ABM – Handling
  - Behavioural indicators – Video footage
- **ASSUREWEL:**
  - Whole flock assessment (distribution, panting, …)
  - Transect walk (walking ability, behaviour, …)
  - Individual measures (25 birds) – Handling (hock burn, …)

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Broilers

Method	EBENE	DIERENWELZIJN SCAN	AWIN	KTBL	WELFARE QUALITY	ASSUREWEL
Benchmark possibilities	Quartiles No filter (soon: "age")		Comparison to the median value of a reference population	??	??	Ongoing
Advice available	Generic advice	Generic advice (risk factor listing per indicator)	Risk factors	??	Risk factors	??
App available	Android 2020: iOS implementation	Android and iOS	Android Soon implemented for iOS ?	Ongoing		
Validity	Expert / stakeholders consensus regarding the choice of the indicators and methods		Expert / stakeholders consensus regarding the choice of the indicators and methods		Expert / stakeholders consensus regarding the choice of the indicators and methods	Several on-farm trials
Reliability	Several on-farm trials to assess if similar results are obtained between 2 assessors and if results are similar from one day to another		Several on-farm trials ?		Several on-farm trials - QBA not reliable	
Feasability (lenght)	Around 1 hour	1.5 to 2 hours	< 1 hour	??	Half a day	

No more information for RSPCA welfare assessment

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Broilers

Method	EBENE	DIERENWELZIJN SCAN	AWIN	KTBL	WELFARE QUALITY	RSPCA	ASSUREWEL
Main pros	App used in France and available on Android and soon on iOS Participative approach Reliable and feasible method Indicators on the outdoor range Already existing guidelines Offline assessment Online platform Scoring system and benchmarking	App ready-to-use: iPhone & Android (smartphone & tablet) Offline data recording (pausing possibility) Online platform (dynamic programming of questionnaires & reports) potential risk factors past scanning results (monitoring over time) anonymous benchmarking	App used in Spain and available in English on Android (and soon on iOS ?) Reliable and feasible method Already existing guidelines Offline assessment Benchmarking	Indicators related to depopulation (but assessed at the slaughter plant)	Reliable method Already existing guidelines Indicators related to depopulation (but assessed at the slaughter plant)		Reliable method Indicators related to depopulation (but assessed at the slaughter plant)
Main cons	Not available in english_but planned for 2020 App and guidelines only in French No indicators for the catching process Not available for Apple devices Fixed Sample Size	Dutch only No indicators for assessment depopulation No indicators for use of outdoor area Small – Fixed Sample Size Not possible to differentiate between different units (same farm)	No indicators for use of outdoor area No indicators for the catching process Very few behavioural indicators and indicators focused on pain	No app available No behaviour observations Only in German	No app available Very few behavioural observations Very long	Only for experimental use, not suitable for self assessment	No app available Very few behavioural observations

- **Most promising tools and why:**
  - Based on the indicators (behavioural ones or not)
  - Self-scan or not
  - Validity, reliability, feasibility

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Laying hens

EBENE	DIERENWELZIJN SCAN	KTBL
Self-assessment tool for farmers developed through a participative approach Species: broilers, turkeys, guinea fowls, quails, laying hens, rabbits	**Self-assessment** tool for farmers Species: broilers, laying hens, pigs, cattle	**Self assessment** tool for farmers developed with farmers, vets, scientists Species: broilers, laying hens, turkeys, pigs, cattle

WELFARE QUALITY	ASSUREWEL
Overall welfare assessment Species: poultry (laying hens, broilers), pigs, cattle	Overall welfare assessment for certification schemes Species: broilers, laying hens, pigs, cattle, sheep

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Laying hens

Method	EBENE	DIERENWELZIJN SCAN	KTBL	WELFARE QUALITY	ASSUREWEL
Outdoor use indicators	Behavioural observations and range description	Average % of birds being outdoors (light period)		Cover on the range	(just if a ceratin proportion of animal on the range : assessment for bird dirtiness and feather loss)
Depopulation indicators			Observation at the slaughter plant: injury, DOA		
List of ABM	**Sanitary**: Small, injury, lame, mortality, dead, feather quality, beak trimming quality, other abnormality **Behaviour**: distribution, panting, negative social interaction, foraging, walking, postive social interaction, wing and leg stretching/flapping, dustbathing, preening, human/animal relation, panic reaction	**Sanitary**: Crest (colour, lesions), Keel bone damage, Plumage condition, Foot (pad) lesions, Respiratory symptoms (sneezing, coughing, nasal or ocular discharge, …), Abnormal faeces, Mortality; beak trimming Y/N, laying %, egg quality **Behaviour**: Dustbathing – Foraging, Use of enrichment, Competition for drinking	**Sanitary:** mortality, foot pad dermatitis, injury, feather cover, fractures, keel bone damage	**Sanitary:** Plumage damage, Comb abnormalities + pecking wounds, skin lesion, enlarged crops, eye pathologies, enteritis, parasites, respiratory infections, keel bone deformation, foot pad, toe damage, dermatitis, beak triming quality, mortality, culls **Behaviour:** panting, huddling, aggressive behaviour, avoidance distance test, novel object test, QBA, Use of nest boxes, litter use	**Sanitary** : feather loss, bird dirtiness, birds needing further care, mortality **Behaviour:** antagonisctic behaviours (aggressive behaviour and injurious feather pecking), flightiness (calm, caution, flighty)
List of RBM	Feeders and drinkers availability, Litter quality, Perches availability, available space, range type, on-farm culling method, other intervention (beak trimming, …), farmer's practices, enrichment availability	Type of housing, light regimen, number of drinking nipples, availability (covered) free-range, type of enrichment, design free-range, presence of red mites, litter quality	Water consumption, ATB use, weight, egg quality	Drinker space, Feeder space, shape and total lenght of available Perches, slatted floor, dust sheet test, stocking density, evidence of red mites, parasites, enrichment, free range, cover on the range, covered veranda	Beak trimming

- List of essential indicators, of indicators to be submitted to NPGs & of indicators to be studied more in depth

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

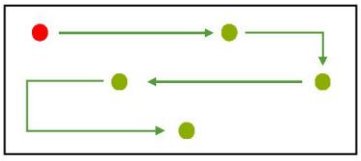
Welfare self assessment tools_ Laying hens EBENE

- **Method:**
  - Individual screening for sanitary observations (45 hens: 15 stops and 3 hens observed each time)
  - Animal sampling for behavioural observations (6 areas – 2mns obervations)
  - No handling

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare self assessment tools_ Laying hens DIERENWELZIJN SCAN

- **Method:**
  - Transects
  - 5 stops with group and individual screening (3 birds per stop)
  - Handling



PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

BOERENBOND trouw aan land- en tuinbouw

Welfare assessment tools_ Laying hens OTHERS

- **KTBL:**
  - Animal sampling - Handling
- **WELFARE QUALITY:**
  - Observation at different locations (4 to 8 locations according the kind of behavioural observations)
  - 100 birds (10 birds from 10 locations) for sanitary assessment
  - Handling
- **ASSUREWEL:**
  - 50 birds for feather loss and bird dirtiness
  - Take into account the proportion of animals in different locations to assess some indicators (even on the range) or whole flock

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Laying hens

Method	EBENE	DIERENWELZIJN SCAN	KTBL	WELFARE QUALITY	ASSUREWEL
Main pros	App used in France and available on Android and soon on iOS Participative approach Reliable and feasible method Indicators on the outdoor range Already existing guidelines Offline assessment Online platform Scoring system and benchmarking	App ready-to-use: iPhone & Android (smartphone & tablet) Offline data recording (pausing possibility) Online platform (dynamic programming of questionnaires & reports) potential risk factors past scanning results (monitoring over time) anonymous benchmarking	Indicators related to depopulation (but assessed at the slaughter plant)	Reliable method Already existing guidelines Indicators related to depopulation (but assessed at the slaughter plant)	Reliable method Indicators related to depopulation (but assessed at the slaughter plant)
Main cons	Not available in english_but planned for 2020 App and guidelines only in French No indicators for the catching process Not available for Apple devices Fixed Sample Size	Dutch only No indicators for assessment depopulation No indicators for use of outdoor area Small – Fixed Sample Size Not possible to differentiate between different units (same farm)	No app available No behaviour observations Only in German	No app available Very few behavioural observations Very long	No app available Very few behavioural observations

- **Most promising tools and why:**
  - Based on the indicators (behavioural ones or not)
  - Self-scan or not
  - Validity, reliability, feasibility

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Pigs

DIERENWELZIJN SCAN	BEEP	KTBL
Self-assessment tool (App) for farmers Species: broilers, laying hens, **pigs**, cattle	**Self-assessment** tool (Excel) for farmers Species: **fattening pigs**	**Self-assessment** tool for farmers Developed with farmers, vets, scientists Species: broilers, laying hens, turkeys, **pigs**, cattle

WELFARE QUALITY	ASSUREWEL	RSPCA WELFARE STANDARDS FOR PIGS	AMERICAN HUMANE SOCIETY CERTIFIED
Overall assessment of welfare Species: poultry (laying hens, broilers), **pigs**, cattle	Overall welfare assessment for certification schemes Species: broilers, laying hens, **pigs**, cattle, sheep	Freedom Food (farm assurance and food labelling scheme) based on ASSUREWELL	Audit Tool for American Humane Certified assessors Species: broilers, laying hens, hatcheries, **pigs**, cattle, bison, goats, ducks, turkeys

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Welfare assessment tools_ Pigs

- Separate tool for:
  - Sows?
  - Growing pigs?
  - Finishing pigs?
  - Depopulation process?

- Including assessment of free-range usage

PPILOW Kick-off meeting, 4th – 6th September 2019, Paris, France

Method	DIERENWELZIJN SCAN	BEEP	KTBL	WELFARE QUALITY	ASSUREWEL
Animal group	Sows (including piglets), Growing Pigs, Fattening Pigs	Growing, Fattening Pigs (no sows)	Sows (including piglets), Growing Pigs, Fattening Pigs	Sows (incl. piglets), Growing Pigs, Fattening Pigs	Finishing Pigs, Dry Sows
Outdoor use indicators	N	N?	N	N	Behaviour (rooting in dunging area or manipulation of areas of ground contaminated with manure, manipulation of turf or clean areas of ground)
Depopulation indicators	N	N?	N	(unloading - slaughterhouse): slipping, falling, reluctance to move, turning back, shivering, panting, sick, dead, space allowance & bedding lorry, lameness	N
ABM	**Sanitary**: mortality, BCS, BW/age, coughing, sneezing, manure consistency, rectal/vaginal prolapse, underdevelopment, abormal breathing, cleanliness, bursitis, ruptures-hernias, tail lesions, ear lesions, integument alterations, lameness, shoulder sores, vaginal discharge, mastitis, teat injuries, vulva lesions, replacement %, number of litters, % stillbirth **Behaviour**: usage of enrichment, competition for drinking/feeding, pos. & neg. behaviour, stereotypies, huddling (piglets) **Management**: tail docking, castration, age of weaning, cleaning of sows pre-partum	**Sanitary**: cleanliness, growth delay, wounds (tail, ear, flank, fight), lameness, BCS, diarrhea, coughing, sneezing **Behaviour**: tail biting, behaviour towards human, usage of enrichment **Management**: tail docking	**Sanitary**: BCS, bursitis, presence of ectoparasites, repeat breeders, abortion rates, mortality/culling, number of litters, cleanliness, integument alterations, lameness, shoulder sores, teat injuries, underdeveloped, claw disorders, daily weight gain, tail length, tail lesions, ear lesions **Behaviour**: stereotypies **Management**: antibiotic usage	**Sanitary**: BCS, bursitis, lameness, wounds, respiratory signs (coughing, sneezing, pumping), twisted snouts, rectal/uterine prolapse, scouring, skin condition, ruptures/hernias, mortality, cleanliness, vulva lesions, constipation, metritis; shoulder sores, local infections, neurological signs, splay leg, **Behaviour**: shivering, panting, huddling, tail biting, social, exploratory, stereotypies, fear of humans, QBA **Management**: castration, tail docking, age of weaning, nose ringing, teeth clipping	**Sanitary**: lameness, pigs needing further care (i.e. treatment, hospitalisation or culling), tail lesions, body wounds/marks, cleanliness, leg swelling, skin conditions, mortality, shoulder lesions, vulva lesions, BCS **Behaviour**: enrichment usage, manipulating others, stone chewing, ear & flank biting **Management**: tail docking, nose ringing
RBM	Type of feed/floor/housing, ventilation, availability & type of enrichment, number & functioning drinking nipples, feed spaces, space allowance, heating piglet nest	Type of enrichment, floor type, feeding system, occupation of pen, moisture on walls, cleanliness drinking & feeders	Availability of enrichment, water provision (number, functioning)	Water supply (number, functioning, cleanliness drinking points), space allowance, farrowing crate size	N

Welfare assessment tools_ Pigs

- **RSPCA WELFARE STANDARDS FOR PIGS**
  - Labelling Scheme based on Assurewel
- **AMERICAN HUMANE SOCIETY CERTIFIED**
  - Animal Welfare Standards Audit Tool

Dierenwelzijn Scan_ Pigs

- **Sows** (5)
  - Pregnant sows (2 – 3 wks after insemination)
  - Pregnant sows (1 – 2 wks after rehousing)
  - Lactating sows & their litter (1 – 2 wks after farrowing)

- **Growing pigs** (5 groups – 50 pigs)
  - → 8 – 10 wks old

- **Finishing pigs** (5 groups – 50 pigs)
  - → 4 wks before slaughter

PPILOW Kick-off meeting, 4th – 6th September 2019, Paris, France

BOERENBOND

BEEP_ Pigs (self-assessment tool)

- **From weaning to end of fattening**
- **Large number of pigs scored (4 rooms)**
  - Group screening : all animals : 500-600 pigs
  - Individual screening : 50 pigs mini / Mini 2 pens / room
- **Animal Welfare Indicators**
  - Based on the 4 animal welfare principles
  - Animal-based indicators mainly
  - Time-span of about 20 min / room → 1,5 hours
- **Feedback after each assessment**
  - Results per stage / at farm level
  - Comparison to the database references

BEEP DE L'ifip
Le bien-être en élevage de porcs

PPILOW Kick-off meeting, 4th – 6th September 2019, Paris, France

Welfare assessment tools_ Pigs

Method	DIERENWELZIJN SCAN	BEEP	KTBL	WELFARE QUALITY	ASSUREWEL
Data proceeding	Calculation of %, score calculation (0-100) key indicators (using weighing factors)	?		Calculation of a %, index, …	Calculation of %
Scoring & aggregation	Scoring system from 0 to 100 for key indicators (no aggregation)	?		**Scoring system from 0 to 100** for each indicator and **aggregation** among 12 criteria and among 4 welfare principles	Only calculation of %?
Benchmarking	Y (see later)	Traffic light system?			
Advice available	Generic: online risk factor listing per indicator	?			Standard document « Explanation of measures »
App available	Y Android & iOS	N Not ready yet	N Not ready yet	N	N
Self-scan for farmers	Y	Y	Y	N	Y: "training is required to ensure reliable and accurate results"
Validity		Y	~WQ	Expert / stakeholders consensus regarding the choice of the indicators and methods	
Reliability				Several on-farm trials	Training is required to ensure reliable & accurate results
Feasability (lenght)	1.5 to 2 hours	1.5 hours		> half a day	+/- 30 minutes

Welfare assessment tools_ Pigs

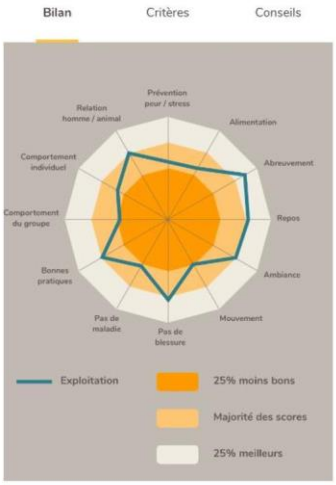
Method	DIERENWELZIJN SCAN	BEEP	KTBL	WELFARE QUALITY	ASSUREWEL
Main pros	App ready-to-use: iPhone & Android (smartphone & tablet) Offline data recording (pausing possibility) Online platform (dynamic programming of questionnaires & reports) potential risk factors past scanning results (monitoring over time) anonymous benchmarking	Participative approach / easy appropriation by farmers Method reliable and feasible: no ambiguous evaluation Already existing guidelines Large amount of animals scored Tested in straw based and conventional systems	Self-scan ("light" version of WQ) Guidelines (pictures – films) existing	Reliable method Already existing guidelines Indicators related to depopulation (but assessed at slaughter plant)	Straightforward 30 min Reliable method?
Main cons	Dutch only No indicators for assessment depopulation No indicators for use of outdoor area Small – Fixed Sample Size Not possible to differentiate between different units (same farm)	Guidelines only in French No app (on going development) Database in construction → thresholds per indicator **No sows**	No app available No behaviour observations (except stereotypies in sows) Only in German	No app available Very long No self-assessment tool	No app available Few behavioural observations No indicators related to depopulation

- **Most promising tools and why:**
  - Based on the indicators (behavioural ones or not)
  - Self-scan or not
  - Validity, reliability, feasibility
  - **BUT: leverage from other tools (e.g. depopulation indicators, scoring, aggregation, …) !**

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Feedback/Benchmark_EBENE

- **The results are provided to the farmers with a radar chart and 12 welfare scores:**
  - Blue line: farmer results
  - Orange: 25% worse scores; Yellow: majority of the scores; White: 25% best scores
  - Anonymised benchmark
    - Among a specific company or among independant farmers
    - Only between indoor broilers only OR outdoor broilers only
- **Results are available online (excel or pdf export) + list of previous assessments**



PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Feedback/Benchmark_EBENE

- **Advice provided**
  - Not specific advice regarding the results ➔ the same advice is always provided

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

Feedback/Benchmark_Dierenwelzijn Scan

- **Mobile application** ⟶ offline data recording
- **Website** ⟶ online platform (www.dierenwelzijnscan.be)
  - potential risk factors
  - past scanning results
  - anonymous benchmarking
- **Animal Welfare Indicators**
  - animal-based '*outcome*' indicators
  - allowing straightforward scoring (self-scan!)
  - limited but instructive number of animals
  - time-span of about 1.5 – 2 h
- **Feedback after online submission of completed scan**
  - report automatically generated calculating scores for each key welfare indicator (0-100 scale)
  - scores depicted over time & benchmarked anonymously

Google Play (Android)

App Store (iOS)

PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

BOERENBOND

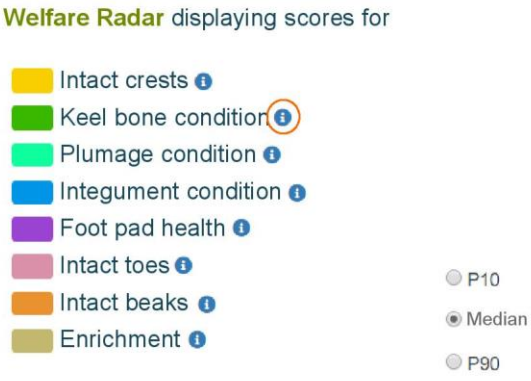
Feedback/Benchmark_Dierenwelzijn Scan

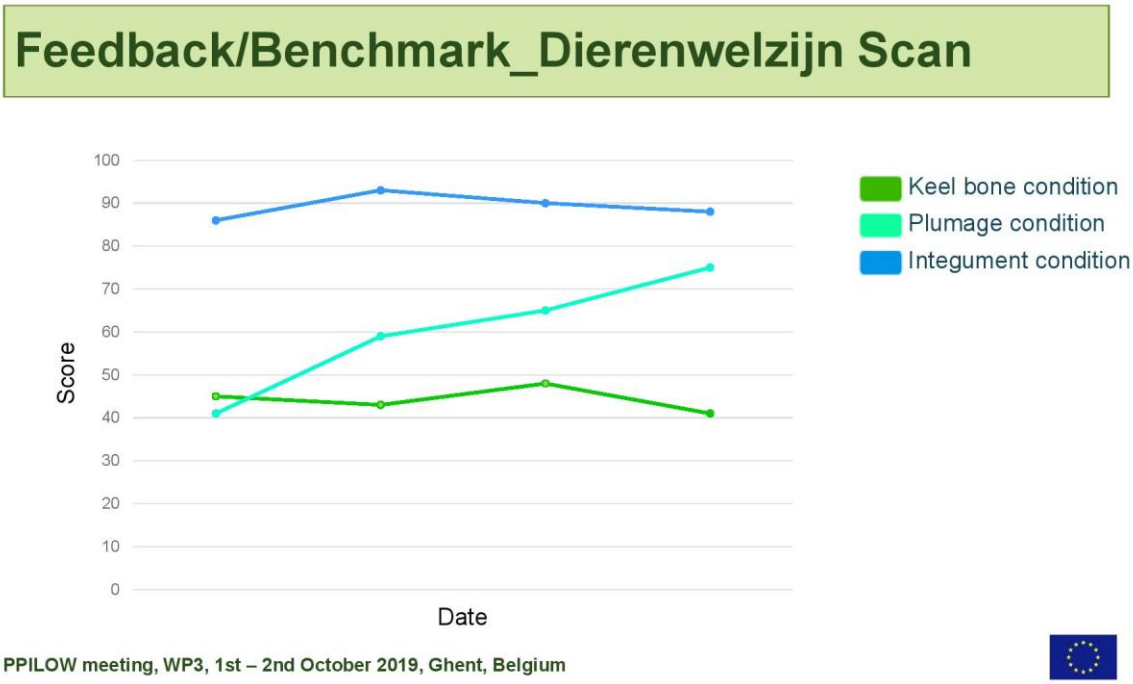
- **Report with Welfare Radar** → **e-mail with PDF (+ online)**

BOERENBOND trouw aan land- en tuinbouw

Feedback/Benchmark_Dierenwelzijn Scan

Laying Hens




Feedback/Benchmark_Dierenwelzijn Scan
100
90
80
70
60
50
40
30
20
10
0
Score
Date
Keel bone condition
Plumage condition
Integument condition
PPILOW meeting, WP3, 1st – 2nd October 2019, Ghent, Belgium

B. Consent forms of the apps

➢ **Poultry - General terms of use of the EBENE® application and website and legal notice**

1. General terms of use of the EBENE® application and website and legal notice

- **Introduction**

EBENE® is a tool enabling users, mainly farmers, agricultural technicians and vets, together with their partners, to assess the well-being of poultry for meat production (chickens, turkeys and guinea fowl), laying poultry (cage-free and/or free-range) and rabbits, using methodology based on research programmes conducted by the Institut Technique de l'Aviculture (French Technical Institute of Aviculture).

The tool can be used to:

- raise awareness among users, particularly poultry and rabbit farmers, as well as the individuals and companies that provide advice for farmers, on issues surrounding animal well-being,
- evaluate the key well-being indicators on farms,
- track changes over time regarding well-being on any given farm,
- benchmark the results of well-being indicators for a specific batch,
- propose ideas for improving farming practice with the aim of continually advancing the well-being of farmed poultry and rabbits

- **Scope and enforceability**

The purpose of this document is to set out the terms for accessing and using the EBENE® website (hereinafter the "site" or "website") and the EBENE® mobile application (hereinafter the "application" or "mobile application") published by the Institut Technique de l'Aviculture. The prescriptions contained in this document apply to all use of the site and application.

The terms of use also apply to users of the EBENE® web service, which is subject to a special licence.

These general terms of use are enforceable, deemed to have been read and applicable on the date of the first visit or use of the site and/or application by the user. The fact that users do not have to click to accept these terms of use does not under any circumstances constitute an obstacle to their enforceability.

Users may waive their right to use the website and application at any time, but remain responsible for any previous use.

Contractual documents

The contractual documents enforceable upon users are:

- these general terms of use;
- any special conditions applying to certain services accessible within the application.
-

In the event of a contradiction between documents of different types or in different ranks, it is expressly agreed between the parties that the provisions contained in the documents of the higher rank shall prevail. In the event of a contradiction between the terms of documents of the same ranking, the most recent dated documents shall prevail over the others.

Ranking criteria shall apply, according to the following principles:

- obligation by obligation;
- or, failing that, paragraph by paragraph;
- or, failing that, article by article;

- **Accessibility**

EBENE®, available on the website www.itavitools.fr, is a tool for assessing the well-being of poultry and rabbits, developed by the Institut Technique de l'Aviculture within the framework of various research contracts.

The EBENE® application is accessible on Android (version 4.2 and above).

The application has been designed to ensure the HTML pages are compatible with the W3C standard for use of HTML, CSS and JavaScript. The functional constraints of the application require the use of advanced browser features based on HTML5 technology. As such, the application is compatible with a recent web browser:

Chrome version 63.0 or later
Firefox version 57.0 or later
Edge version 39.0 or later
Safari version 5.0 or later

Compatibility with other browsers (including Internet Explorer) is possible, but not guaranteed. The use of Firefox, Chrome or Edge browsers is strongly recommended for optimal use of the tool.
In all events, and prior to using the application, users are encouraged to verify the compatibility of their hardware with the application.

- **Terms of access**

Access to the mobile application and website requires users to create an account. This account must be created on the EBENE® mobile application. When creating the account, users are required to create a login (email address) and set a password. Users may also select a company (production organisation, veterinary surgery, etc.) with which it shares its assessments. Only companies with a licence are listed as technical partners.

Affiliation of users with a company via the application is subject to prior approval of the company concerned. The affiliation may be refused by the company if it does not work with the user requesting affiliation.

Once the account has been created, access to the basic functions of the mobile application and website is free. Access to paying functions is subject to subscribing to a special licence.

User identification, via their login and password, results in irrefutable accountability for operations performed using said login and password.

The login and password provided on the website and application are confidential, unique and personal. Consequently, users undertake to keep their logins and passwords secret as a performance obligation.

The Institut Technique de l'Aviculture allows a single connection per login and password at any given time.

Website and/or application users without a personal account are prohibited from accessing personal accounts and undertake not to enter or try to enter said accounts. Any such access shall be deemed fraudulent.

In the event of a password being lost or stolen, users must inform the Institut Technique de l'Aviculture by sending an email to contact_EBENE@itavi.asso.fr. Furthermore, any site or application user without a personal account that accidentally accesses an account without permission undertakes to notify the site editor at the following address: contact_EBENE@itavi.asso.fr.

Users are exclusively liable for all costs relating to access, whether the cost of hardware, software or Internet access. They are solely responsible for both their equipment and their Internet access.

The service is accessible 24/7, subject to the limitations specified in these terms of use.

In particular, the Institut Technique de l'Aviculture undertakes to make every effort to ensure users can access the site and application at all times. However, the Institut Technique de l'Aviculture cannot be held responsible in the event of site or application unavailability, irrespective of the cause.

The Institut Technique de l'Aviculture reserves the right to interrupt access to its site and application at any time, especially for maintenance purposes. In this case, the Institut Technique de l'Aviculture is not bound by any obligation to provide site users with prior warning. Furthermore, the Institut Technique de l'Aviculture cannot be held liable for harm or damage of any kind that may result from these changes and/or any temporary unavailability or the permanent shutdown of all or part of the application or one or more of its services.

Moreover, certain website and application functions are only accessible to users that have subscribed to a user license.

Users of the site and application acknowledge having the necessary skills and resources to access and use this site/application.

Users of the site and application acknowledge having verified that the settings of their equipment permit them to use the site and/or application and their functions.

The Institut Technique de l'Aviculture does everything possible to provide users with the appropriate information and tools, but it cannot be held responsible for discontinuity of the site or application and their services, whether voluntary or not.

The Institut Technique de l'Aviculture reserves the right to supplement or modify the application at any time, in particular to add new functions, modify existing functions or take developments in technology into account.

- **Hosting**

The site and application hosted by ONEPOINT, a Simplified joint-stock Company with share capital of 1,078,730 euros and headquarters located at 29 rue des Sablons 75116 PARIS, registered in the Paris Trade & Company Register under no. 440 697 712, on behalf of the Institut Technique de l'Aviculture (ITAVI).

- **Liability**

The Institut Technique de l'Aviculture does its utmost to provide users with available and verified information and/or tools, but cannot be held liable for any errors, omissions or unavailability of information and services, or for the presence of a virus on its site or application. Users declare acknowledgement of the above information prior to visiting the site and using the application. By choosing to access the application and site, users expressly and irrevocably accept the following terms.

The Institut Technique de l'Aviculture cannot guarantee the information provided on its site and application is accurate, exhaustive, complete or up-to-date. Likewise, it cannot guarantee the continuity of its correct functioning or full computer security.

The information provided on the site and application is for information purposes only and does not exempt users of the site and/or application from performing additional and customised analyses.

Users of the site and/or application undertake to use the site and/or application services, together with all information it may access, solely for purposes that comply with public order, morality and the rights of third parties.

Consequently, users acknowledge that they use the information and tools available on the site and/or application under their exclusive responsibility. In particular, users acknowledge that the liability of the Institut Technique de l'Aviculture may not be sought with respect to the pertinence and accuracy of the assessments.

- **Force majeure**

The Institut Technique de l'Aviculture cannot be held responsible for any failing or lack of access to the service subsequent to a case of force majeure, as defined by article 1218 of the French Civil Code and by French case law.

The following are also deemed to be cases of force majeure: partial or total, internal or external strikes, in particular within the Institut Technique de l'Aviculture or an Internet service provider, lockouts, fires, floods, water damage or other natural disasters, pandemics or epidemics affecting over 10% of personnel of the Institut Technique de l'Aviculture, blockage and/or dysfunctions of telecommunication, electricity or computer networks, providing said dysfunctions are not caused by the technical resources implemented by the Institut Technique de l'Aviculture, wars, military operations, attacks or civil unrest, together with amendments to any regulations applying to the service.

- **Security**

Users of the site and application undertake not to commit any act that may affect the computer security of the site, application or the computer systems of other users.

Users undertake not to interfere with or interrupt the normal functioning of the site and the application

The Institut Technique de l'Aviculture makes every effort, in accordance with industry best practice, to secure the service in light of the complexity of the Internet, but cannot provide absolute security.

Users declare they accept the characteristics and limits of the Internet. They acknowledge they are aware of the nature of the Internet network, in particular its technical performance and the response time for consulting, querying or transferring data.

Users must notify the Institut Technique de l'Aviculture of any failures.

Users are aware that data circulating on the Internet is not necessarily protected, especially as regards any misappropriation.

Users accept to take all appropriate measures to protect their own content, data and/or software from contamination by any viruses on the Internet network.

- **Intellectual property**

The application, site and EBENE® tool belong to and are operated by the Institut Technique de l'Aviculture.

The content and its general structure on the website and application, together with the software, texts, images, animated or still, photographs, videos, expertise and methods used and all elements comprising the aforementioned, are the exclusive property of the Institut Technique de l'Aviculture or its partners that have granted it a licence.

The above also applies to any databases on the site and/or application, which are also the exclusive property of the Institut Technique de l'Aviculture.

The distinctive signs of the Institut Technique de l'Aviculture and its partners, such as domain names, trademarks and trade names, together with the logos on the site and/or application are protected by intellectual property rights.

These terms of use do not include any transfer whatsoever of intellectual property rights over the elements belonging to the Institut Technique de l'Aviculture.

As such, users undertake not to reproduce, sell, publish, exploit and disseminate content protected by intellectual property rights, without the prior, written consent of the Institut Technique de l'Aviculture.

Any partial or total reproduction of these distinctive signs performed using the elements of the site and/or application without the express consent of the Institut Technique de l'Aviculture is therefore prohibited. In particular, EBENE® and its logo are a trademark registered with the INPI under national no. 4427926. This trademark cannot be used without the prior, written consent of the EBENE® User Committee.

Elements belonging to the parties, such as trademarks, logos, images, texts and sounds, without this list being exhaustive, are the exclusive property of their authors and are protected as such by copyright, trademark rights or any other rights recognised by current legislation.

Users are prohibited from directly or indirectly breaching property rights of third parties whose content features on the application and website and are prohibited from exploiting these elements in any way.

Users undertake to respect in full the rights of third parties whose content features on the application and website.

- **Hypertext links**

Site users cannot set up a link to this website without the prior, express consent of the Institut Technique de l'Aviculture.

Under no circumstances may this consent be deemed to be an implicit affiliation agreement.

In all events, any links to the website must be withdrawn at the first request of the Institut Technique de l'Aviculture.

The Institut Technique de l'Aviculture reserves the option of setting up links on its website and application, providing access to other resources on the Internet. The Institut Technique de l'Aviculture cannot be held liable for access by users of the site and/or application via these links, or for the content of information provided on these websites through activating said links.

- **User licenses**

The Institut Technique de l'Aviculture grants the user a simple right to use the application and website. This license is revocable, free of charge, non-exclusive and worldwide as regards consultation of the site and application and is restricted to France for the conducting of surveys and use of the results.

It is intended for use by the user and/or on behalf of the assigned organisation under these terms of use and the user licence subscribed by the beneficiary company on its own behalf and that of its users.

Users undertake only to use the application in accordance with its purpose within this framework, not to commit to any acts of infringement, not to reproduce, download, represent, modify all or part of the application and website and not to disrupt their proper functioning and, in particular, not to introduce any virus or any other technology that may harm the application or associated services.

Users are fully responsible for any use they make of the application and website. They undertake to use the application and website fairly, in compliance with these terms of use, together with applicable laws and regulations, in particular intellectual and industrial property laws.

The Institut Technique de l'Aviculture reserves the right to suspend use of the application for any user that does not comply with these terms of use and to communicate all necessary information to the relevant services in charge of law enforcement.

- **Cookies**

Under article 32 II of the French Data Protection law 78-17 of 6 January 1978, the installation of certain cookies, in cases where their exclusive purpose is not to permit or facilitate communication by electronic means, or where they are not strictly necessary for providing an online communication service at the request of the user, is subject to the user's consent.

During the first visit to the site and/or application therefore, or after each deletion of cookies in the browser, users are informed by a banner that continuing their navigation entails acceptance of the installation of these cookies on their hardware. A cookie will be installed to remember users' choices. If users delete this cookie, their consent shall be once again required.

Personal data

As data controller, the Institut Technique de l'Aviculture processes personal data collected from you under use of its website and application.

This data is as follows:

- User last name (*)
- First name (*)
- Email (*)
- Trading name (*)
- SIRET number (*)
- INUAV number of the building(s)
- Batch number of the animals being assessed

The purpose of the data processed by the ITAVI in this context is as follows:

- For group users: no personal data will be processed, since the Institut Technique de l'Aviculture will not have access to this data
- For independent users: to have contact details to identify you and manage an assessment log
- For qualified users: to manage the identity of qualified persons and update a list of current qualifications and renewal dates

The purpose of the data processed by licensed companies in this context is as follows:

- User identification to provide advice via teams of technicians or vets
- To compare the results of assessments with other breeding parameters that groups may have at their disposal

The legal basis of processing is the performance of the contract that binds us to you;

Data marked with an asterisk is compulsory for responding to your request.

This data is intended for the relevant, authorised apartments of the Institut Technique de l'Aviculture, companies selected by the user and the service provider in charge of technical database management. The service provider is bound to the Institut Technique de l'Aviculture by a duty of confidentiality and non-dissemination of database details.

Due to the objective to constitute technical and scientific references based on the assessments, anonymised data is kept for an unspecified period. However, personal data collected by the ITAVI under these terms of use is kept for the period required for the purpose for which it was collected, namely for the duration of the agreement, plus legal prescriptions. Cookies are kept for 13 months.

Under current legislation and regulations, you have the right to access, rectify, delete or limit the processing of your data, oppose the processing of your data, data portability and the right to set out instructions concerning what happens to your data when you die. The aforementioned rights can be exercised by sending an email to contact_EBENE@itavi.asso.fr or by post to La Directrice de l'Institut Technique de l'Aviculture, 7 rue du Faubourg Poissonnière 75009 Paris, attaching a photocopy of a signed ID document to your request. You also have the right to file a complaint with the CNIL.

- **Data collection consent**

The EBENE® mobile application, website and database of the Institut Technique de l'Aviculture aim to enable effective collaboration between the various users of the EBENE® method and application, and partner companies or service providers.

Acceptance of these general terms of use by a user constitutes explicit consent for the Institut Technique de l'Aviculture to process anonymous statistical data based on the results of assessments, within the limits set out by the User Committee.

Selection of a partner company from the list of proposed companies (production organisations, veterinary surgeries, advisory bodies, etc.) when creating an account constitutes consent for the Institut Technique de l'Aviculture to provide the selected companies (and only these companies) with information collected during assessments, either by the users themselves or by company representatives.

- **Use of collected data by the Institut Technique de l'Aviculture**

The Institut Technique de l'Aviculture has created an EBENE® application and website User Committee. This Committee brings together users of paying licenses, as well as key poultry sector players. This Committee is responsible for issues surrounding the use of data and the collective and anonymous results gathered from the EBENE® database.

The Institut Technique de l'Aviculture, which owns the database, only has anonymous access to the individual data of farmers and production organisations using the EBENE® application and website. The identity of users is known solely in the form of an identification number and the Institut Technique de l'Aviculture does not have information enabling it to match identification numbers to user names. Only independent farmers that are not joined to a production organisation on the application declaration form are subject to data registration by name.

Under its research & development activities, the Institut Technique de l'Aviculture does not publish or disseminate any result by name from its database. The ITAVI does not disseminate any processed results, even collective and anonymous, without the prior consent of the User Committee and all data is processed in compliance with the provisions of the French Data Protection law.

The analyses of results helps to improve the method, indicators and the baseline of the tool.

These points are specified in the licence agreement

- **Use of collected data by a farmer's partner company**

Acceptance of the general terms of use by the representative of a partner company of a user, in particular, a farmer, or by its representatives (employees or others) implies full compliance with the rules regarding data use set by the User Committee.

Users retain full control over use of data collected during assessments on farms. The partner companies of users accept that the information collected on farms using the mobile application, by the farmer or a third party on their farm (including representatives of the company), may be deleted, non-centralised or non-

qualified in the database. They also acknowledge the right of users to withdraw their consent, as detailed in the following paragraph.

Right to access, modify and delete data

Information entered into the EBENE® site and application, together with the results of performed assessments, features on the EBENE® platform with the consent of users of the tool. Users also agree to the nature and rules of data use, as described in the previous paragraphs entitled "Use of collected data by a farmer's partner company" and "Use of collected data by the Institut Technique de l'Aviculture". This consent is granted at a given moment and remains in force for as long as it is not withdrawn by the user.

Users reserve the right to withdraw this consent, by removing access to data by the farmer's partner companies without any notice being required. Users have the option of completely deleting their profile and all related data.

In the event of a user deleting their profile and/or data, partner companies of users cannot oppose said deletion and shall be obliged to propagate this deletion in their own information systems in cases where this data has been integrated into their IS. The partner companies of users have 30 days to propagate this deletion of all data concerning a user as from the date of deletion on the EBENE® platform.

General provisions

The Parties agree to execute their obligations in good faith.

Users agree that the fact that the Institut Technique de l'Aviculture tolerates a situation may not be construed as granting the user any acquired rights. Moreover, such elements may not be interpreted as a waiver to assert the rights in question.

These terms of use may not be assigned by users, wholly or partially, free of charge or in exchange for payment.

Should any difficulty arise in interpretation resulting from a contradiction between any of the headings of the clauses and any of the clauses, the heading shall be declared non-existent.

Should one or more stipulations of these terms of use be held as invalid or declared as such by application of a law, regulation or following a final ruling by a competent court, the other stipulations shall retain their full force and scope.

Modification

The Institut Technique de l'Aviculture reserves the right to modify and update these terms of use at any time and without notice.

Website and/or application users are expressly informed that the terms of use that apply are those accessible online at the time they connect to the site or application according to the case in question.

Website and/or application users are therefore invited to consult the terms of use regularly.

Last updated: July 2018

- **Applicable law and jurisdiction**

The site and application, together with the methods and terms of use, are governed by French law, irrespective of the place of use.

In the event of difficulties interpreting this document, French law prevails.

Moreover, in the event of any dispute, and, after any attempt to reach an amicable solution has failed, French courts shall be solely competent for judging disputes arising from the application of these terms of use.

- **Monitoring and comments**

We invite you to send us your questions and comments concerning our services and notify us of any content you deem to be inaccurate. Please send us your comments, along with a copy of the content in question, by email to contact_EBENE@itavi.asso.fr.

2. LEGAL NOTICE

Publishers

Pursuant to the provisions of article 6-I-1 of law 2004-575 of 21 June 2004 on trust in the digital economy, the EBENE® website and mobile application is published by:

The Institut Technique de l'Aviculture (ITAVI)
A registered Association with SIREN no. 339 155 681
Headquarters: 7, rue du Faubourg Poissonnière 75009 PARIS
Tel: +33 (0)1 45 22 62 40
VAT no. FR 08 339 155 681

Publication Director

The Publication Director of the website and application is Anne Richard, in her capacity as Director of the Institut Technique de l'Aviculture, 7, rue du Faubourg Poissonnière 75009 PARIS.

Hosting

The service provider maintaining direct and permanent storage is ONEPOINT, a Simplified joint-stock Company with share capital of 1,078,730 euros and headquarters located at 29 rue des Sablons 75116 PARIS, registered in the Paris Trade & Company Register under no. 440 697 712.

Telephone number: 01 70 23 03 00

Intellectual property

The application and website are the property of the Institut Technique de l'Aviculture (ITAVI). EBENE® and its logo is a trademark registered with the INPI under national no. 4208620. This trademark cannot be used without the prior, written consent of the ITAVI.

Design: Institut Technique de l'Aviculture - Société ONEPOINT.
Development and graphic design: Société ONEPOINT.

- **Pigs - General terms of use of the PIGLOW application and website and legal notice**

Privacy Statement - ILVO

Why is a privacy statement needed?

ILVO attaches great importance to respecting your privacy and strives for high-quality processing of your personal data. ILVO ensures that the processing of the personal data obtained is done in accordance with the legal and regulatory frameworks.

What (personal) data do we process and what do we process it for?

- App use requires an e-mail address (to be provided by the user during a one-time registration), which is necessary to receive the automated report via e-mail after submission of the data collected on-farm, and to allow log-in to the user account online (www.piglow.eu). After uploading the data (collected by the user) via the PIGLOW app, the e-mail address of the user will automatically be replaced by a unique artificial identifier (or pseudonym) prior to data storage, processing and analysis.
- Hence, only pseudonymised data will be stored and analysed.
- The data will be automatically processed by ILVO and the report will be automatically sent to the e-mail address provided by the user during the one-time registration.
- Consequently, ILVO personnel will only have access to pseudonymised data for research purposes.

What are your rights in relation to your data?

A user can deactivate his/her PIGLOW user account online at any time (www.piglow.eu). However, the stored data cannot be cleared as these data are pseudonymised.

You can look at the information we have available about you at any time. If certain data is not found to be correct, you can have it corrected. The erroneous data will be deleted.

If you believe that we are improperly processing your data, you can complain to the Flemish Supervisor (Flemish Supervisory Committee for the processing of personal data).

Who can you contact for more information?

For more information you can always contact the ILVO Data Protection Officer:

Bart Ampe T + 32 9 272 26 56 privacy@ilvo.vlaanderen.be

The full and most recent version of the ILVO privacy statement: can be consulted on our website.

Full ILVO Privacy Statement:

General Privacy Policy

Why is a privacy statement needed?

ILVO sometimes needs some personal data to carry out its work.

ILVO attaches great importance to respecting your privacy and strives for high-quality processing of your personal data. ILVO ensures that the processing of the personal data obtained is done in accordance with the legal and regulatory frameworks.

This means that we:

- Process your personal data in accordance with the purpose for which it was provided
- Limit the processing to the data required within this purpose

- Request your explicit consent when required by law
- Have taken appropriate, technical and organisational measures to safeguard your personal data.

Applicability

This policy applies to IVA ILVO and EV ILVO, referred to as ILVO below.

IVA ILVO is an internal independent agency without corporate personality, established within the Flemish Government by decision of the Flemish Government of 9 December 2005, abbreviated as “ILVO”. ILVO belongs as a scientific institution to the Agriculture and Fisheries policy area.

At ILVO, the decree of the Flemish Government of 23 December 2005 laying down provisions for the supervision of the 2006 budget set up an Own Capital “Eigen Vermogen” fund to which a corporate personality has been granted, abbreviated EV ILVO.

IVA ILVO and EV ILVO together form Flanders Research Institute for Agriculture, Fisheries and Food (ILVO).

The central administration of ILVO is located at 9820 Merelbeke, Burgemeester van Gansberghelaan 92/1.

In this privacy statement we explain to you which personal data ILVO processes, why and for which purposes we use this data, how we protect this data, how long we keep this data and how you can exercise your rights.

What personal data do we process and what do we process it for?

ILVO receives personal data from staff members, employees, external partners, visitors or other groups involved in the scientific research and the general functioning of ILVO. In order to fulfil our legal assignments, it is necessary that ILVO processes the personal data that you make available to us.

Consequently, ILVO may process the following personal data:

- Personal identification information such as name, address, place of birth and date, e-mail address, telephone number, bank account number
- Interaction data such as IP address, cookies, surfing and click behaviour
- Footage such as photos and recordings
- Data collected in the context of scientific research

Sometimes ILVO also conducts research based on personal data; ILVO uses the following sources:

- Personal data already collected by the Government or project partners (e.g. accounting data, agricultural data Statbel, one-time registration of plots of land,...);
- Personal data collected by ILVO itself (e.g. information collected through interviews, focus groups, research on practice or demonstration farms and companies,...).

Personal data in the context of research are always pseudonymized or anonymized for analysis and reporting, unless you have given your explicit consent for non-anonymous reporting.

We only use the data we collect for the purposes for which we have received this data. We describe who can access this data and it is also stored and processed in a sufficiently secure environment.

Why do we use your personal data and for what purposes?

A. The use of your personal data is part of our legal assignments.

The mission of ILVO is to carry out and coordinate policy-building scientific research and its related services with a view to sustainable agriculture, fisheries and food production in economic, ecological social and Social perspective. A comprehensive overview of our assignments is available on this website.
Article 2 of the decree (BVR dd 9.12.2005) defines the ILVO mission: "Conducting and coordinating policy-building scientific research and the related services for sustainable agriculture and fisheries in Economic, ecological, social and societal perspective. Based on scientific disciplines, ILVO will build up the knowledge needed to improve products and production methods, to monitor the quality and safety of final products and to improve policy instruments as a basis for sector development and agricultural rural policy. ILVO will regularly inform the policies, sectors and society."

Article 3 § 1 of the founding decree lays down the tasks of ILVO:

1. conceptualizing, initiating and executing multidisciplinary scientific research and acquiring scientific knowledge, depending on policy needs and questions as well as maintaining the necessary contacts with the Government, industry and society;
2. Translating the acquired insights into policy;
3. The provision of services, based on the scientific expertise, or collaboration with other organizations for fundamental research, applied research or demonstration research, insofar as those investigations fit in with Government policy;
4. The provision of services and products to the Government and third parties to the extent that this fits within the mission and the Management Agreement;
5. contributing to the formation and training of organizations that share information and support development, in particular the Flemish public administrative bodies;
6. Building knowledge and disseminating it, including via scientific publications, research reporting and presentations, and providing the necessary documentation for the Government, the sector and society;
7. awarding of doctoral grants;
8. The granting of scientific cooperation to international, federal and regional initiatives to enable public authorities to fulfil their commitments and commitments in this respect;
9. contributing to the drafting of offers for research by third parties;
10. The acquisition and management of capital, personnel, movable and immovable property which can be used for the achievement of the mission and the tasks set out in this decision'.

Article 38 of the founding decree of EV ILVO determines the tasks of EV ILVO

EV ILVO stands for:

1. The provision of scientific research, expertise and services in the field of agriculture and fisheries for third parties
2. Research and development towards more sustainable farming systems;

3. data collection and scientific advisory tasks in support of the European Common fisheries policy;
4. logistical and operational support for quality control in the plant sector '.

Personal data are also processed for other reasons such as for personnel matters and in the context of business operations such as the maintenance of financial administration, in the context of contract management, audits, dispute resolution.

B. What is our legal basis?

The legal basis on which ILVO processes personal data are:

- our legal obligation
- public interest
- your consent

From which sources do we collect your personal data?

To the extent possible, we use the personal data that you have delivered to us.

In addition, we also receive personal data from other government departments or other project partners. This is how we receive for instance agricultural data from Statbel (Belgian statistical agency), farmer contact details given to use by the Department of Agriculture and Fisheries that ILVO researchers use to send surveys or which ILVO researchers use to request cooperation for interviews, focus groups and research on active farms,.... ILVO has the necessary permissions or protocols in this framework.
An overview of the granted permissions or obtained protocols with the categories of personal data can be found on https://overheid.vlaanderen.be/vlaamse-toezichtcommissie.
The personal data obtained is not kept longer than is strictly necessary. The personal data obtained in the course of the investigation is retained for 5 years after the closing date of the investigation (or longer - until the statutory retention period has expired - if this is required by law and destroyed afterwards. If applicable, if you give your consent or if granted permissions or protocols permit it, the personal data will be retained for any subsequent investigations.

Invoices and contact details for the execution of the agreement are retained for 7 years in view of the tax retention obligation; Some data are retained for 10 years when necessary in the context of European projects.

If your obtained data shall be destroyed while you expect to need the data after that period for a legal claim, we may provide you with a copy of it.

To whom do we pass on your data?

Your data is mainly processed internally. Sometimes ILVO is also obliged to provide information about you to another organization. We will only do this if we are obliged to do so under a statutory regulation, at the explicit request of the judicial authorities or police forces, when you have given your consent or when passing on your personal data is necessary for the execution of our assignment. If personal data is shared in

the context of the execution of our assignment, we monitor its processing through a processor agreement. You can request an overview of the processors we call upon.

It may also occur that another governmental authority requests information about you from us. The public authority must have a mandate to do so or agree on a protocol with us. An overview of the permissions or agreed-upon protocols can be found at (link to permissions stating that there are currently no transfers so it may be stated that there are currently no permissions.)

How is your personal data protected?

ILVO takes sufficient technical and organizational measures to secure your personal data. These measures shall be appropriate and relevant in light of the state of the art and the costs of implementation.

What are your rights in relation to your personal data?

You can look at the information we have available about you at any time. If certain data is not found to be correct, you can have it corrected. The erroneous data will be deleted.
If you believe that we are improperly processing your data, you can complain to the Flemish Supervisor (Flemish Supervisory Committee for the processing of personal data). You can also ask us to erase the data or to save it but not to use it further.
You have the right to submit a reasoned objection (link to contact form for complaints) against the collection and use of your data. If you wish to submit an objection, please explain the specific reason. This objection will be handled by us in due course.

In the event of a dispute or objection, you may temporarily terminate the processing of your data.

Who can you contact for more information?

For more information you can always contact the ILVO Data Protection officer:

Bart Ampe
T + 329 272 26 56
privacy@ilvo.vlaanderen.be
In order to prevent someone other than yourself from requesting, modifying or erasing your data, we ask you to prove your identity by sending a scan/copy of your identity card.

The processing supervisor is:
Flanders Research Institute for Agriculture, Fisheries and Food (ILVO)
Burgemeester Van Gansberghelaan 92 bus 1, 9820 Merelbeke
T + 32 9 272 25 00
ilvo@ilvo.vlaanderen.be

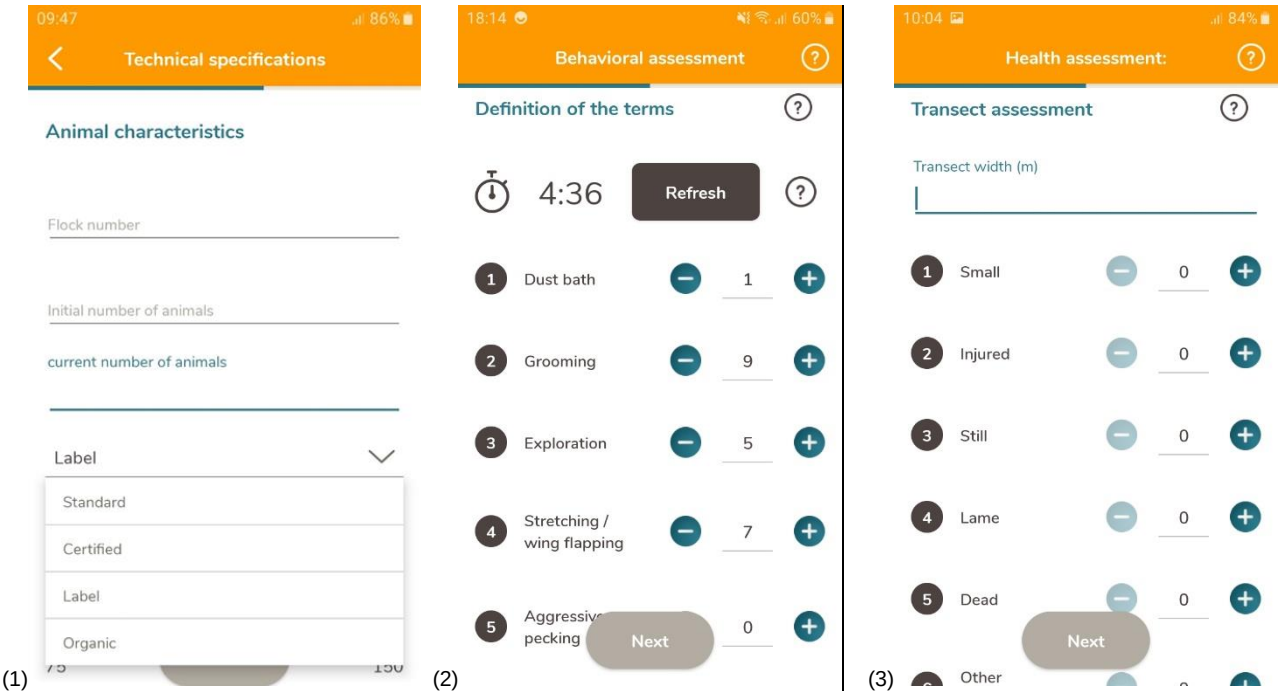
Changes to privacy statement

This privacy statement can be changed by us. The modified version is always published on our website.

C. Screenshot of the apps

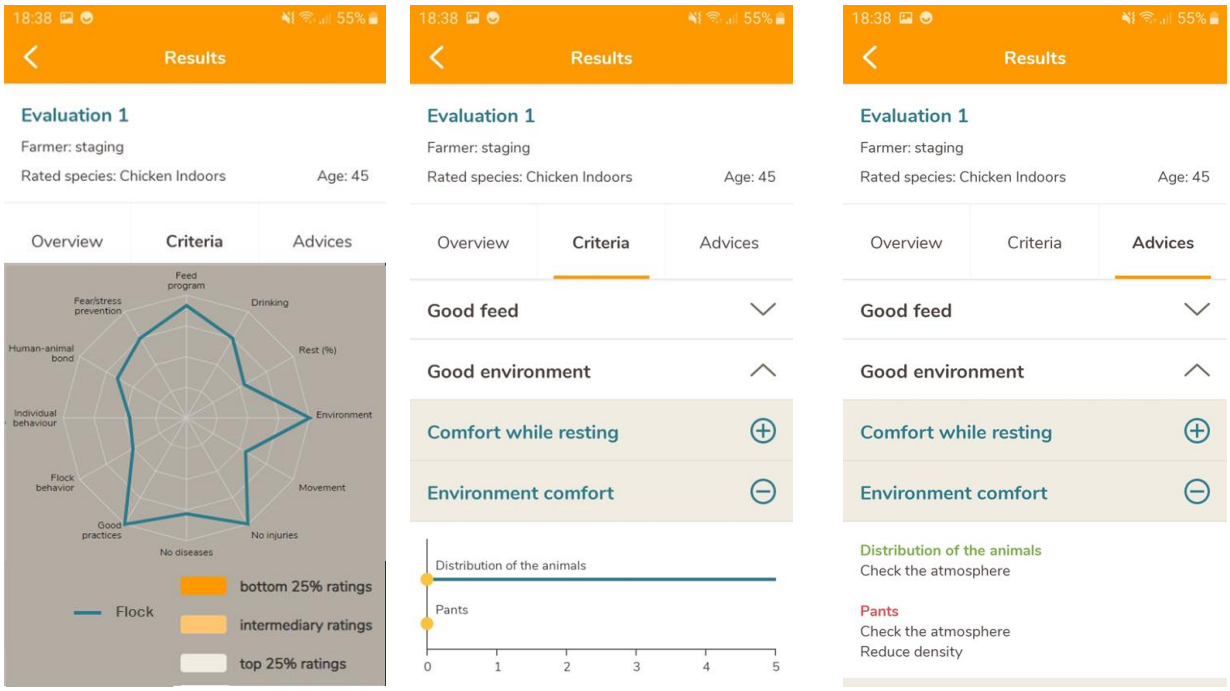
➢ Poultry

The screenshots below are part of the poultry questionnaire (1), behavioural observations (2) and health issues observations (3).

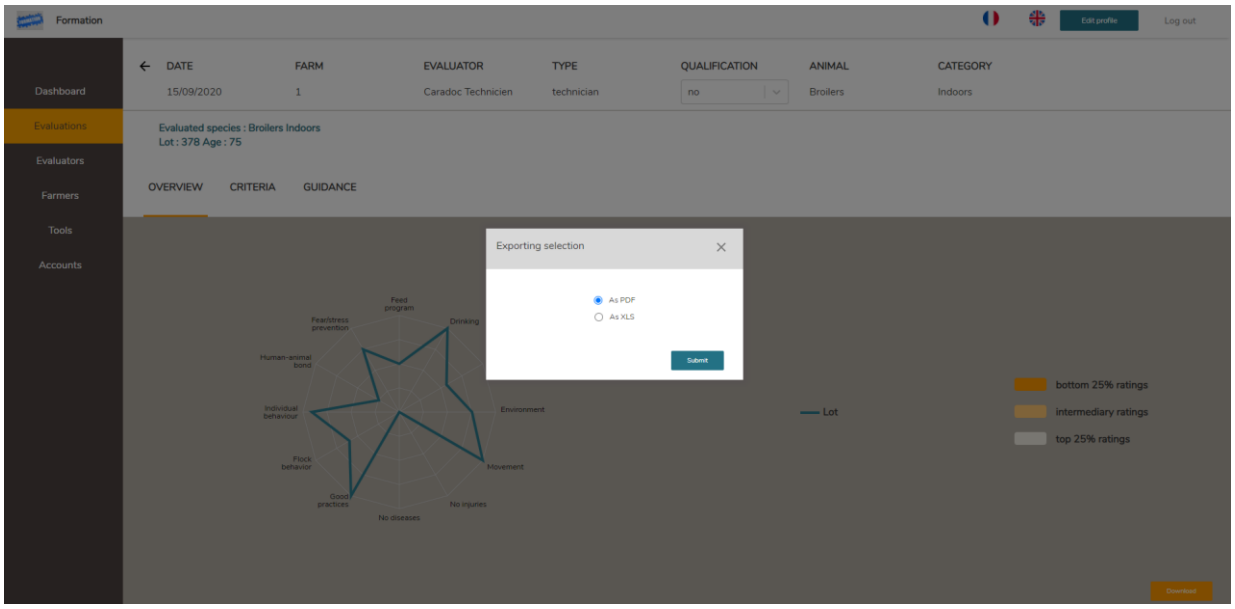


(1) (2) (3)

The screenshots below present the radar chart that is automatically displayed after each assessment on the app and associated screens that provide more details on the scores and some advice to improve the scores. Benchmarking will be available (here is a fake example).

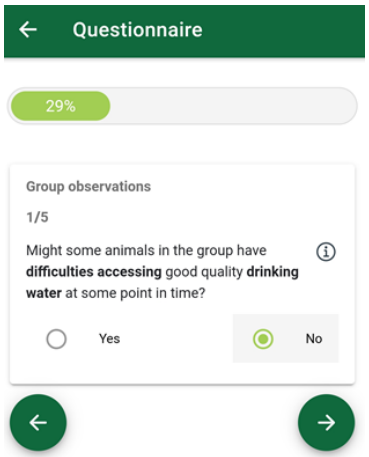


As presented below, researchers also have access to a webpage to download the results as PDF (to send to the farmer is needed) or as Excel file for further analysis.

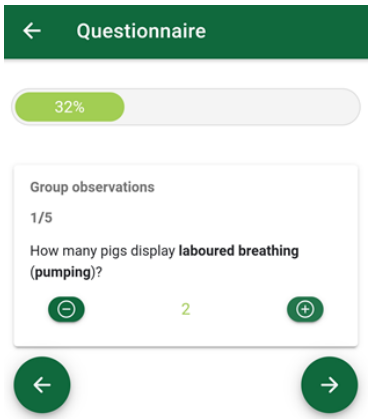


➢ Pigs

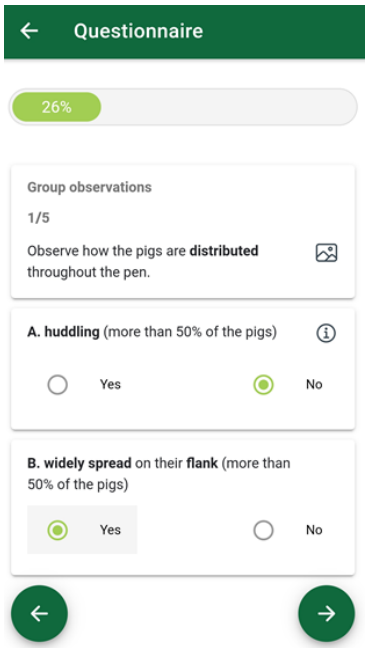
The screenshots below present the observations of the animals in relation to (1) good food; (2) good health; (3) good housing; (4) appropriate behaviours.



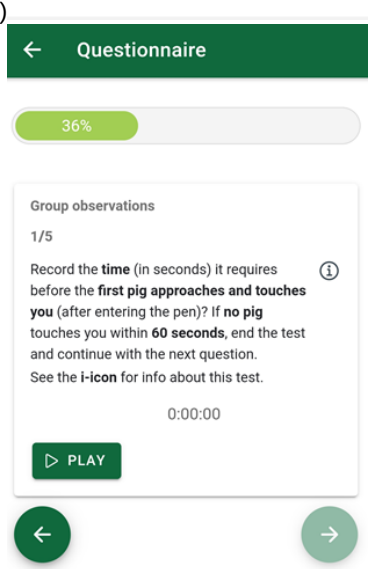
(1)



(2)



(3)



(4)

Then, reports are sent automatically to the farmer with his results (see below). The table contains the farmer results and the benchmarking for each indicator. Evolution graphs are also available fors ome indicators (see graph “Evolution”).

Report

Grower Pigs
29/09/2020 10:08
Farm: test

PDF

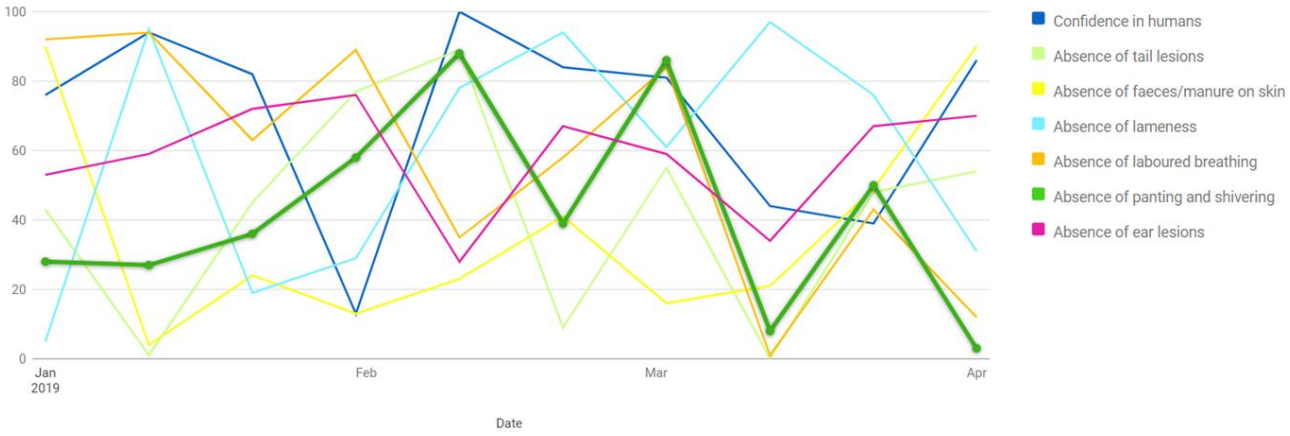
This report contains the results of your welfare assessment. You can click the **i-icon** behind the description of a welfare indicator to find more information about the meaning of that indicator, why it is important for animal welfare and possible risk factors for related welfare problems.

Please **discuss the outcome with your vet** or another expert to determine if you should take action and to come up with a plan that suits your farm.

Appropriate Behaviour

Description	Answers/Score	Benchmarking based on percentile
confidence in humans (average approach time)	10,5 sec	P51
pigs using the enrichment	16,7 %	P67
pigs with at least 15 scratches on one side	0 %	P86
pigs with ear lesions	10 %	P64
pigs with tail lesions	3,3 %	P7

Evolution



D. Feedback from the poultry NPG

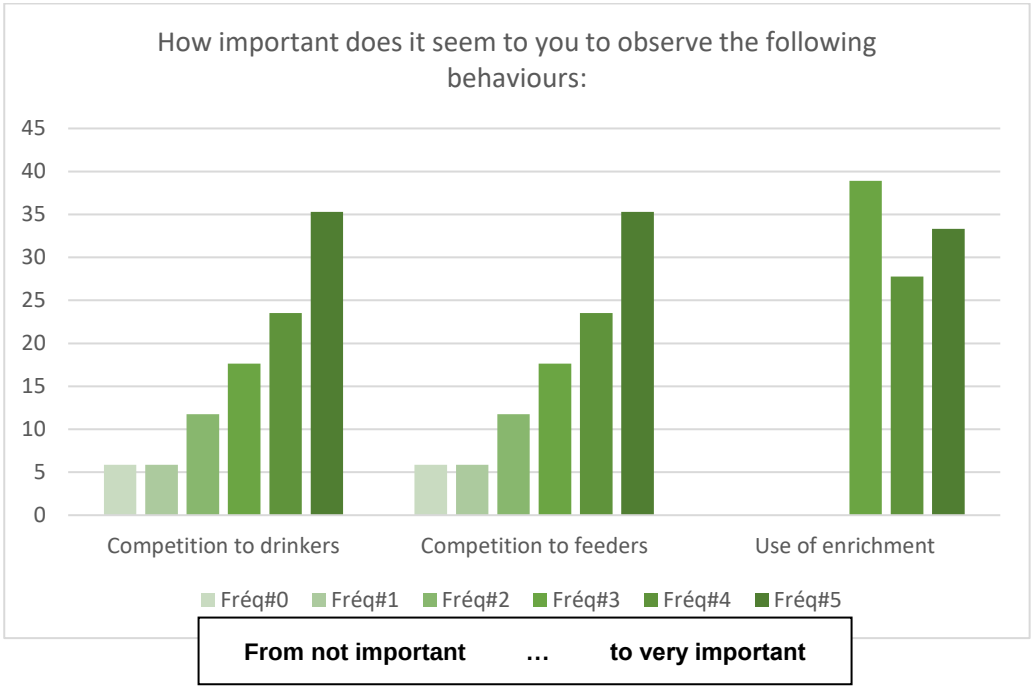
Answers:

- 30 answers in total
  - 11 answers from France NPG (2 for laying hens, 1 for broilers and 8 for laying hens & broilers)
  - 5 answers from Belgium NPG (5 for laying hens)
  - 3 answers from The Netherlands (3 for laying hens & broilers)
  - 1 common answer from Denmark - 8 people at the meeting who discussed altogether the questions and provide a common and detailed answer (only for laying hens)
  - 10 answers from Germany (3 for laying hens and 7 for laying hens & broilers)
- Feedbacks from farmers, farmer organisations, NGO, poultry federation, retailer, genetics company, technical institute, feed company, vet

Answers from Italy NPG are missing due to the Corona virus emergency.

➢ BROILERS (19 answers)

1- Rating questions



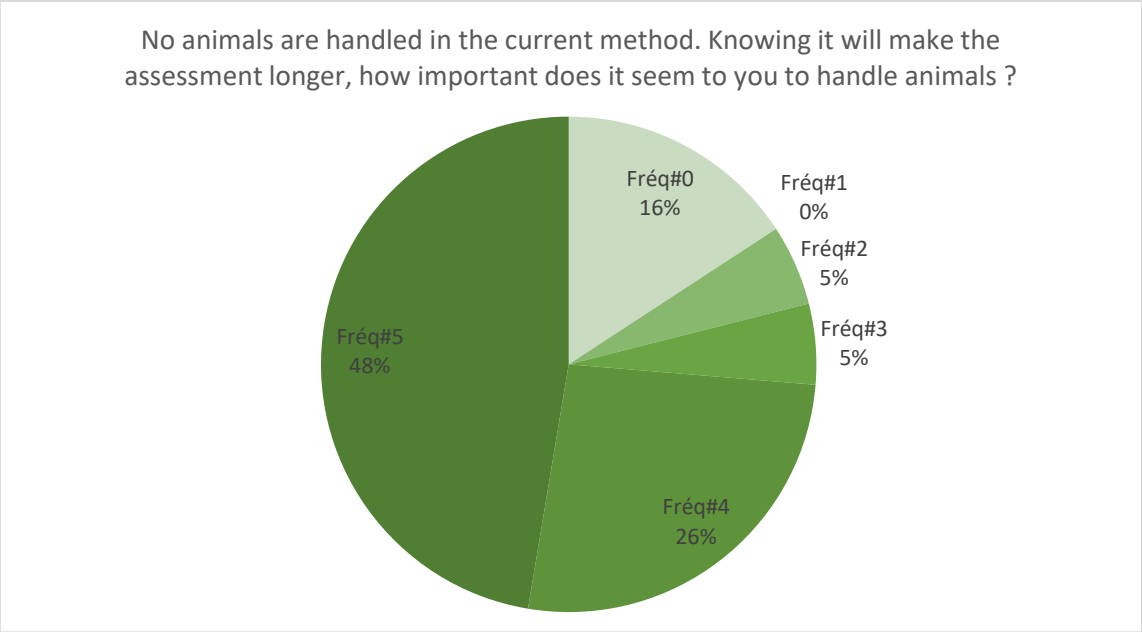
⇨ Competition to drinkers and feeders: for 24% of the practitioners, these indicators are not important (scores from 0 to 2) and for 76% of the practitioners, these indicators are important (scores from 3 to 5). For several practitioners, drinkers and feeders availability is highly regulated that is why it is not important for them to add questions on this topic (as there is already a question about it on the app).

⇨ The indicator “use of enrichment” is important for all the practitioners (all the practitioners gave a score from 3 to 5). A question may be added in the app to ask to the assessor whether the animals use the enrichment during the observation or not. This answer could be used to calculate the score related to “enrichment” that currently only considers presence and diversity of enrichments.

WP3.1 proposal:

- Add a question in the app to record the use of enrichments = Yes/No question. If the enrichments are used, a “bonus” is given to the associated score;

- Add a question in the app to record the competition around feeders / drinkers = Yes/No question. If the answer is “yes”, a penalty is given to the associated score.

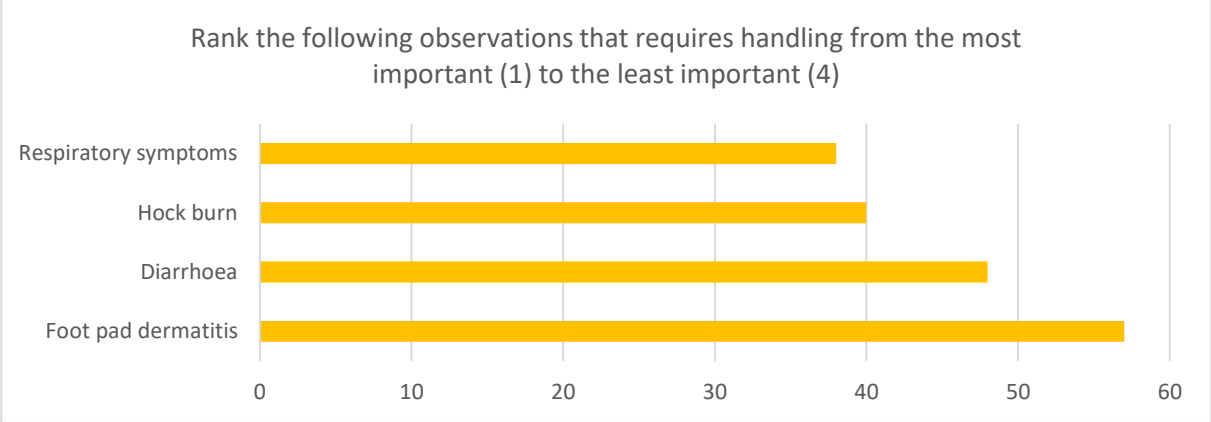


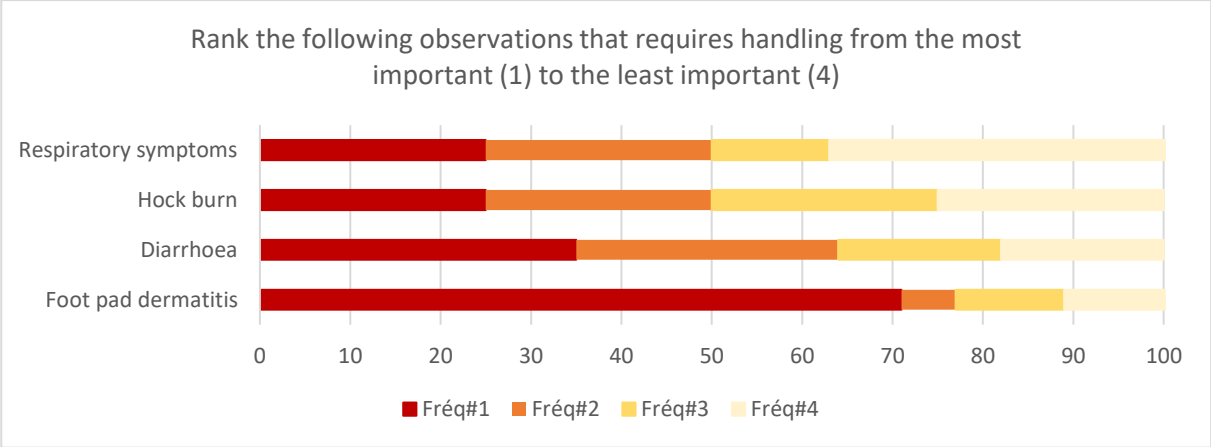
⇨ It is important for 79% of the practitioners to handle animals. As handling animals will make the assessment longer, some practitioners declare it is not important (21% of them). If questions that involve the handling of animals are added, these questions may not be compulsory (not to discourage the ones that would like a self-assessment tool as short as possible). This issue still have to be discussed among PPILOW partners and with farmers involved in on-farm trials of the app.

WP3.1 proposal:

- We should add indicator(s) that require(s) handling

2- Ranking questions





⇨ If questions that require animal handling are implemented in the app, “footpad dermatitis” seem to be the most important indicator to consider (ranked really higher than the other indicators).

WP3.1 proposal:

- The indicator footpad dermatitis is the main important indicator to be implemented in the app. To keep the app attractive and not too long, it was decided to add only one indicator that requires handling. It was proposed to add it as a non-compulsory indicator as French farmers are used to the app without handling and are not willing to spend 10-15mns more minutes for the assessment. There was no consensus about it as we need this information in all the flocks included in the PPILOW study.
- One remark suggests the observation of more indicators to make the animal handling more efficient. This topic still has to be discussed within task 3.1 partners.

3- Immobile broiler

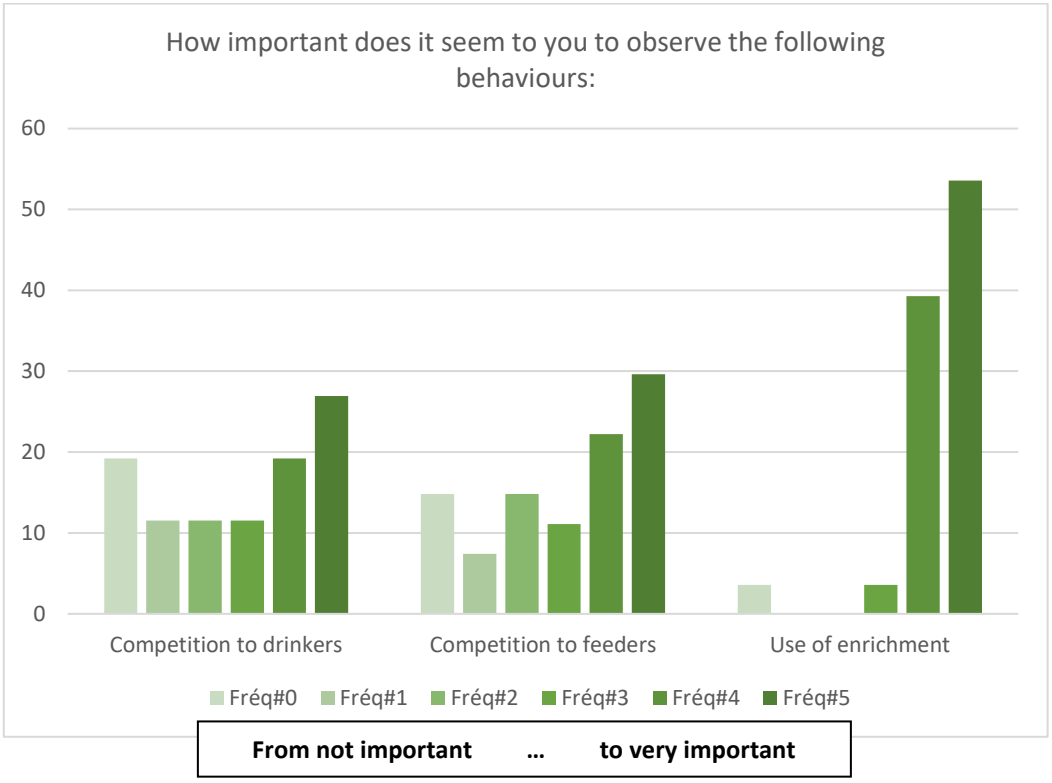
Definitions given by practitioners: “prostrate, no reaction to human (do not move when human approaches less than 2m / or less than 50cm), no reaction to environmental stimuli, dying, sick, stays sitting while the other animals of the group walk away”, only movement is crawling / flapping its wings

WP3.1 proposal:

- Prostrated animal that does not move, even when the assessor « touches » it or approaches it (less than 2m) or when the other animals of the group walk away

➢ LAYING HENS (29 answers)

1- Rating questions



⇨ Competition to drinkers: for 43% of the practitioners, this indicator is not important (scores from 0 to 2).

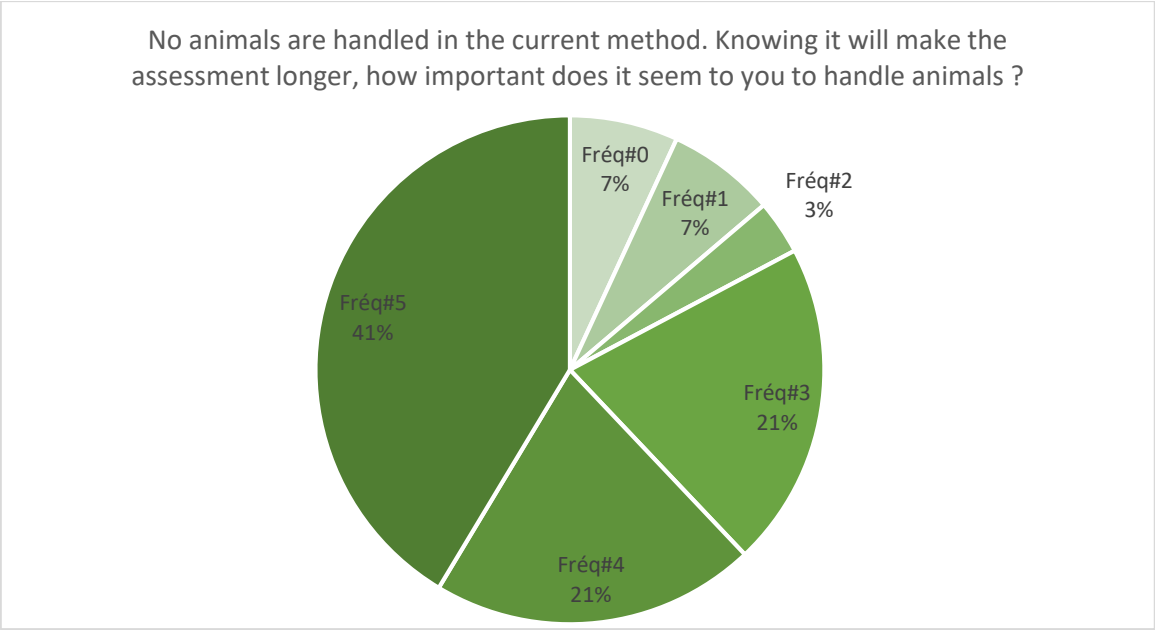
⇨ Competition to feeders: for 37% of the practitioners, this indicator is not important (scores from 0 to 2).

➔ For several practitioners, drinkers and feeders availability is highly regulated that is why it is not important for them to add questions on this topic (as there is already a question about it on the app).

⇨ The indicator "use of enrichment" is important for almost all of the practitioners. Only 4% of the answers declare that it is not important (because they mainly focus on the perch and as it is regulated for poultry, it does not seem important for them to add a question on its use) . A question may be added in the app to ask to the assessor whether or not the animals use the enrichment during the observation. This answer could be used to calculate the score related to "enrichment" that currently only considers presence and diversity of enrichments.

WP3.1 proposal:

- Add a question in the app to record the use of enrichments = Yes/No question. If the enrichments are used, a "bonus" is given to the associated score;
- Add a question in the app to record the competition around feeders / drinkers = Yes/No question. If the answer is "yes", a penalty is given to the associated score.

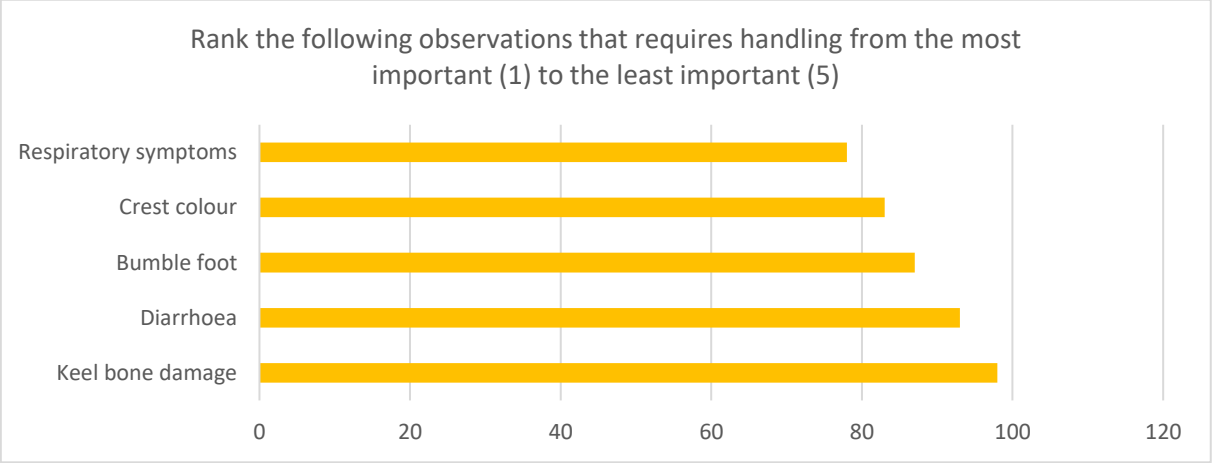


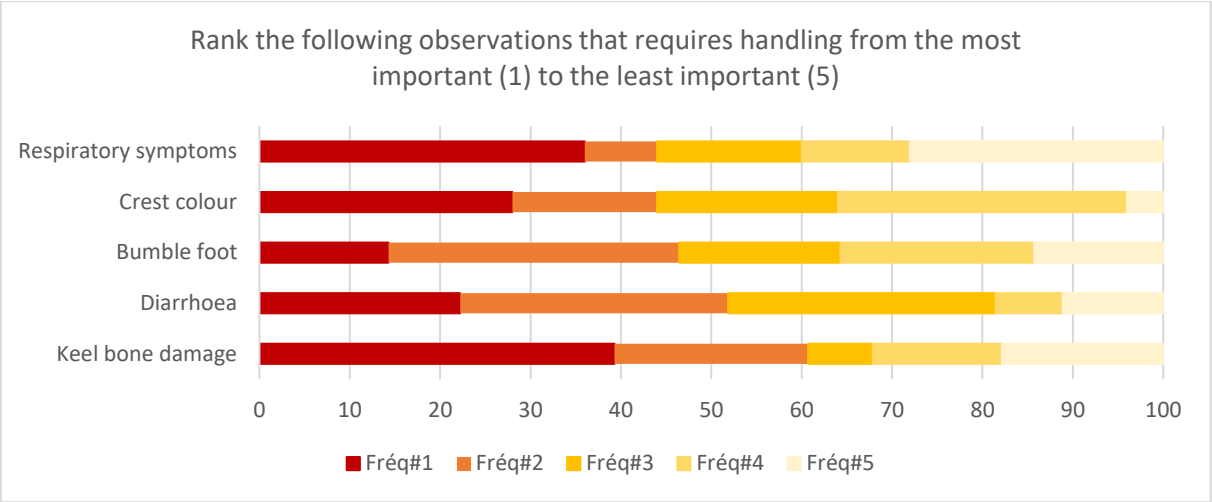
⇨ It is important for 83% of the practitioners to handle animals. As handling animals will make the assessment longer, some practitioners declare it is not important (17% of them). If questions that involve the handling of animals are added, these questions may not be compulsory (not to discourage the ones that would like a self-assessment tools as short as possible). This issue still have to be discussed among Ppilow partners and with farmers involved in on-farm trials of the app.

WP3.1 proposal:

- We should add indicator(s) that require(s) handling

2- Ranking questions





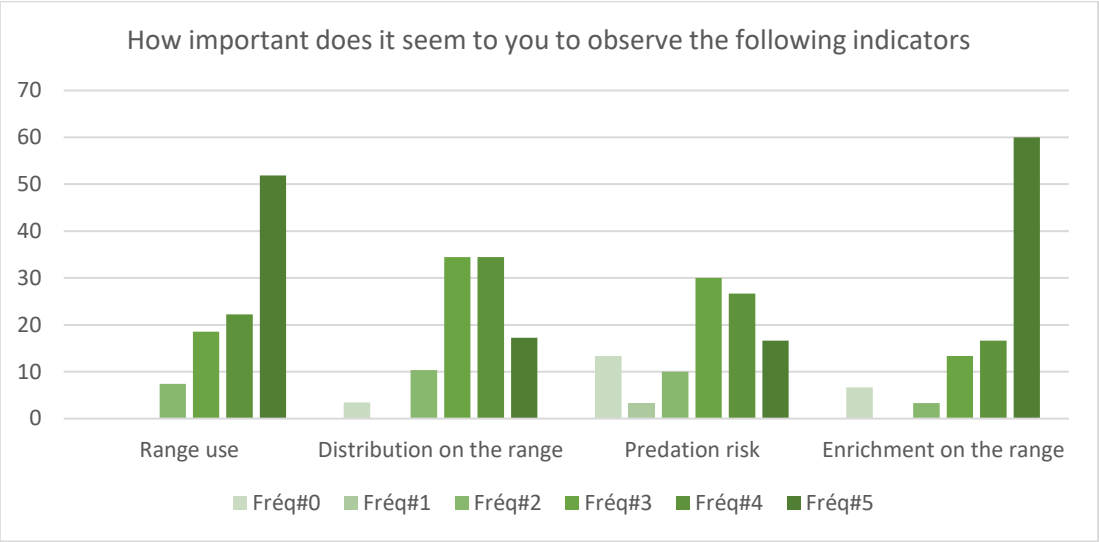
- ⇨ According to the ranking, “keel bone damage” seem to be the most important indicator to consider (ranked higher than the other indicators). The other indicators (“diarrhoea”, “bumble foot”, “crest colour” and “respiratory symptoms”) seem less important than the ”keel bone damage” but are almost equally important regarding the rankings
- ⇨ Respiratory symptoms and crest colour are said to be not relevant by 4 practitioners as it can be observed without handling (or are not relevant for animal welfare)
- ⇨ Keel bone damage is said to be less important for 1 group of practitioner (Denmark) as it is difficult to observe it in the daily routine. If the hens are slaughtered, many slaughter plants will give feedback to the farmer regarding incidence of keel bone damage
- ⇨ Diarrhoea is said to be not relevant by 1 practitioner as it can be observed without handling
- ⇨

WP3.1 proposal:

- The indicator keel-bone damage is the main important indicator to be implemented in the app. To keep the app attractive and not too long, it was decided to add only one indicator that requires handling. It was proposed to add it as a non-compulsory indicator as French farmers are used to the app without handling and are not willing to spend 10-15mns more minutes for the assessment. However, there was no consensus about it as we need this information in all the flocks for the involved in the Ppilow project.

➢ OUTDOOR USE

1- Rating questions



⇨ The indicators “range use” (93% of scores from 3 to 5), “distribution” (87% of scores from 3 to 5) and “enrichment” (90% of scores from 3 to 5) are all considered highly important. Be careful, these indicators are said to be highly dependent on time of the day and season.

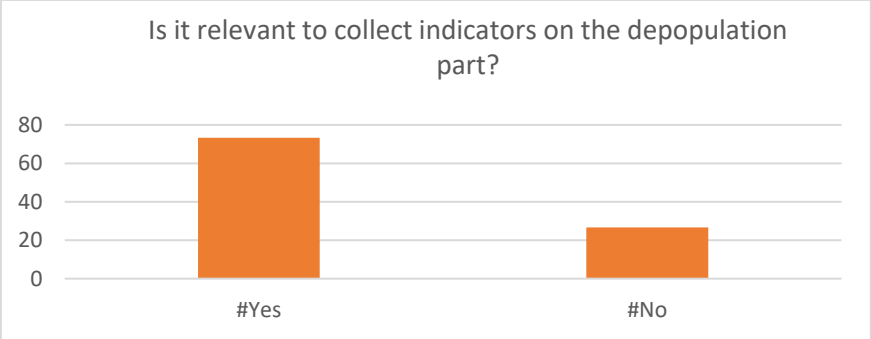
⇨ There is no real agreement for the indicator “predation risk” as 26% consider this indicator as not important.

Other suggested indicators: practices during the sanitary break, sanitary aspects (puddle, tools on the range), rotation to improve quality of the meadow, presence of trees and shrubs, mud, other indicators for range use than animals actually present: signs of scratching, loss of vegetation, distance first cover from the house, presence of pools of water.

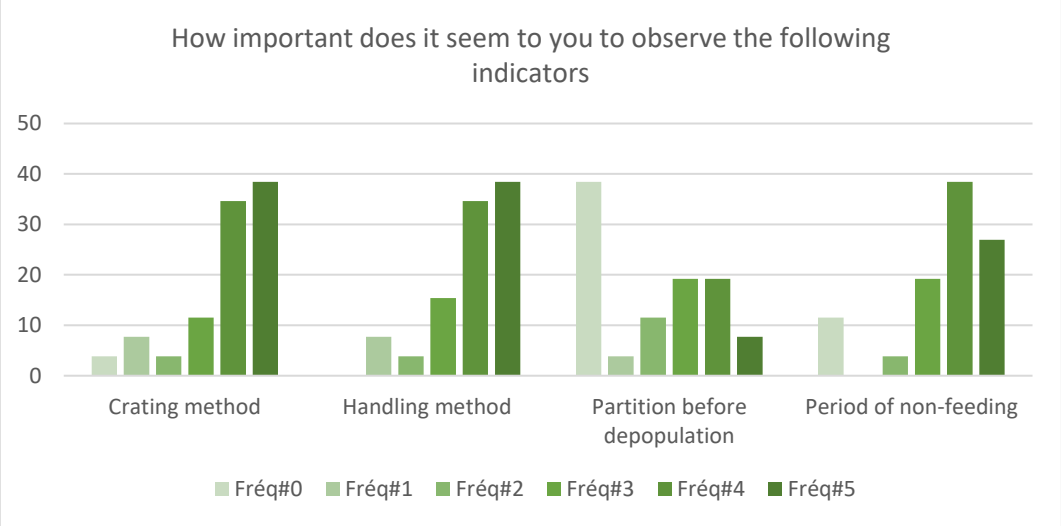
WP3.1 proposal:

- Add a question on range use : % of birds outside and possibility to add a reason (tick boxes) if the percentage is low to detail why (weather conditions, predation risk, …)
- Add a question on distribution on the range
- Enrichment on the range is already assessed in the EBENE app (trees, shelters, …) – no modification
- Do not add a specific question on predation risk (too subjective)
- Keep in mind the other suggested indicators for scientific purposes and project-use tool

➢ DEPOPULATION



⇨ For 73% of the practitioners, it is relevant to collect indicators on the depopulation part



⇨ The “crating” and “handling” methods and the “period of non feeding” are the most important indicators to record (85%, 88% and 84% of scores from 3 to 5 respectively).

⇨ There is no real agreement for the indicator “partition before depopulation” as 54% of the answers ranked it as not important (scores from 0 to 2)

⇨ “Crating method” is said to be irrelevant by one group (Denmark) as slaughterhouses give feedback if birds have damages

⇨ “Partition before depopulation” would increase stress according to one group (Denmark)

Other suggested indicators: crate density, weight per crate, time (in the dark or during daytime), blue light, briefing before catching begins, stuck wings, crate quality, no water deprivation (especially in summer), slaughter results, hours of transport, water and feed consumption per animal on the day of the visit, light intensity, abnormalities in the inner organs, separation of injured birds, feather cover around cloaca

WP3.1 proposal:

- A link will be added at the end of the assessment to enable farmers to fill out a few questions on a website regarding their depopulation practices. It was decided to not include these questions directly into the EBENE® app but to develop a Web Page, free to use by farmers, to self-assess their practices and to have access to recommendations / advice. It should raise awareness among farmers on the good depopulation practices, without being mandatory to fill in.

➢ DURATION

Practitioners were also asked to answer question about assessment duration. The mean, minimum (min) and maximum (max) are presented below for all participants (all) and only for farmers (farmers) in minutes.

	What would be the optimal duration of an assessment for you to use the tool?	**What would be the maximum duration of an assessment for you to use the tool?**
Mean duration (mns)	All : 41 Farmers : 35mns	All : 64 Farmers: 43
Min duration (mns)	All : 15 Farmers : 15	All : 5 Farmers : 5
Max duration (mns)	All : 60 Farmers : 60	All : 180 Farmers: 120

2 farmers won't use it and 2 farmers would like a tool as short as possible for the optimal duration to use it

➢ OTHER REMARKS

Most of the practitioners are in favour of the addition of evolution graph to follow the evolution of specific indicators from one assessment to another. However, too many indicators are important for them. We should wait the end of the on-farm trials so that farmers really know the tool, and ask them again the question to add the most relevant evolution graph.

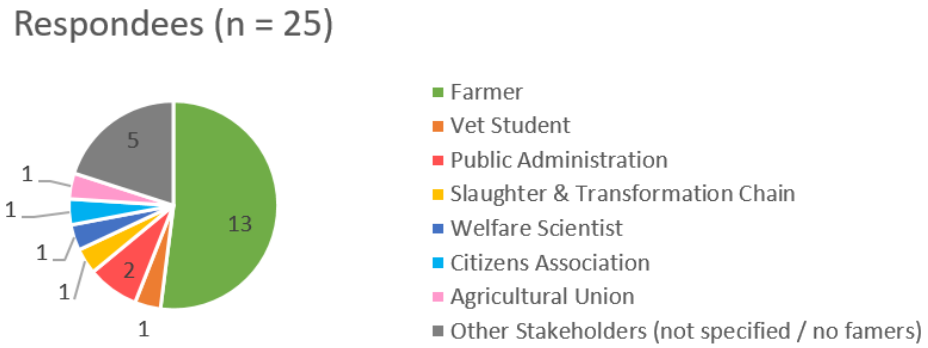
⇨ It was not possible to add this functionality to the EBENE® app or website (too expensive). This functionality will be further discussed with the EBENE® app subcontractor.

E. Feedback from the pig NPG

Answers:

- responses from 3 (out of 5) NPGs were available at the time of the interim analysis
- in total **25 respondees** filled out the questionnaire (see **chart below**)

    - 12 responses from the Walloon NPG (Belgium)
    - 10 responses from the Romanian NPG
    - 3 responses from the Flemish NPG (Belgium)

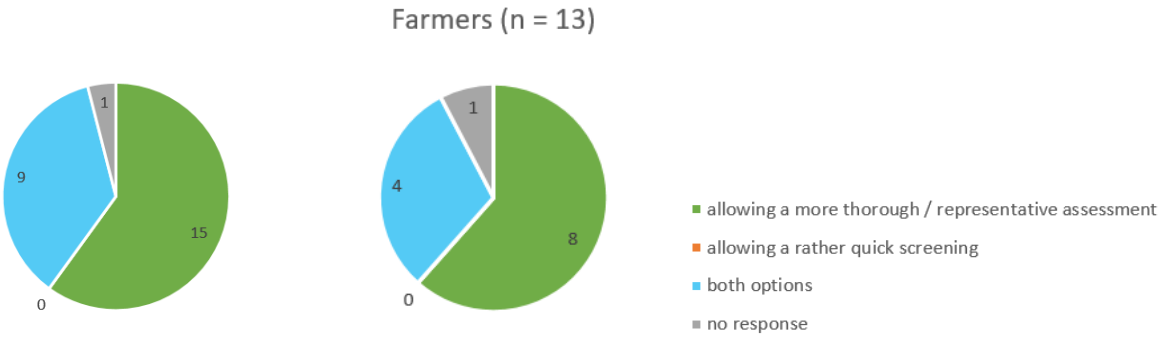


Due to the COVID-19 emergence, the NPG meeting in Italy had to be cancelled, so no responses are expected on the short term. The French NPG meeting was organised too late to incorporate the answers below, but the French feedback is more or less in line with the other NPG's (e.g. competition for drinking/feeding space less relevant, depopulation assessment = feasible, …).

➢ GENERAL QUESTIONS

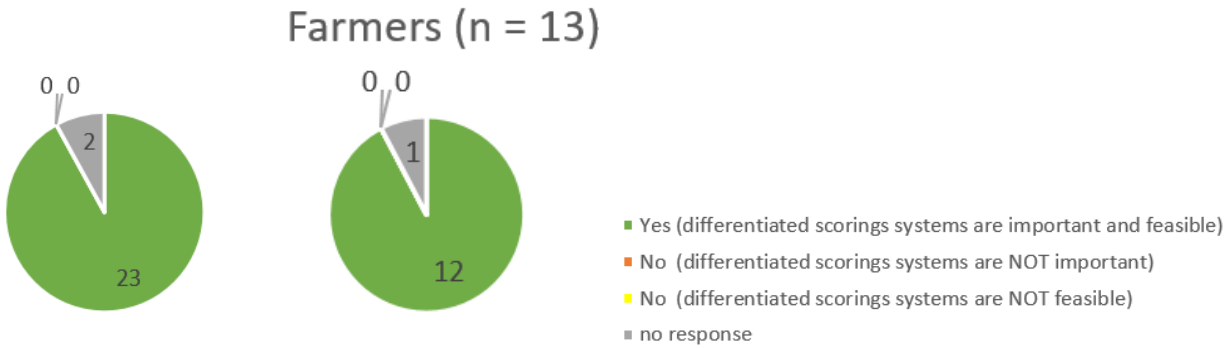
1. Do you prefer to have a self-assessment tool:

- allowing a more thorough / representative assessment more time-consuming depending on your herd size?
- allowing a rather quick screening (less accurate as it would be based on a small proportion of your animals)?
- both options?



Based on these results the pig welfare self-assessment tool (PIGLOW app) will be developed to allow for a **robust thorough (representative, if possible) assessment** of the welfare status on-farm.

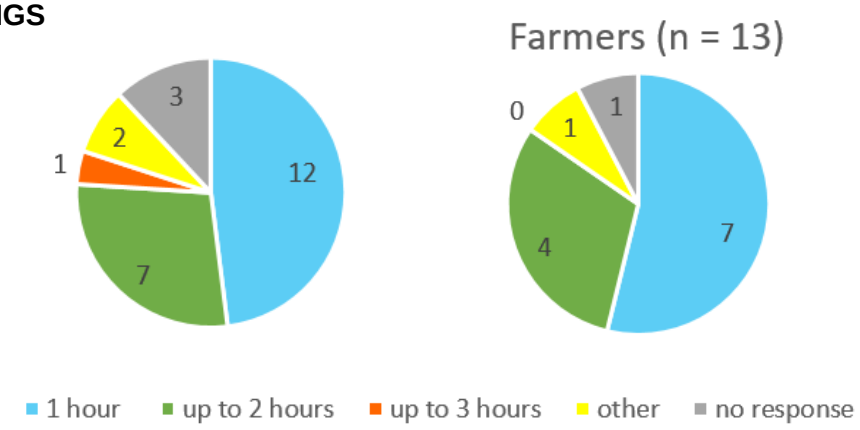
2. Do you think it is important and feasible to have more differentiated scorings systems than simple Yes / No scoring for the different welfare indicators?



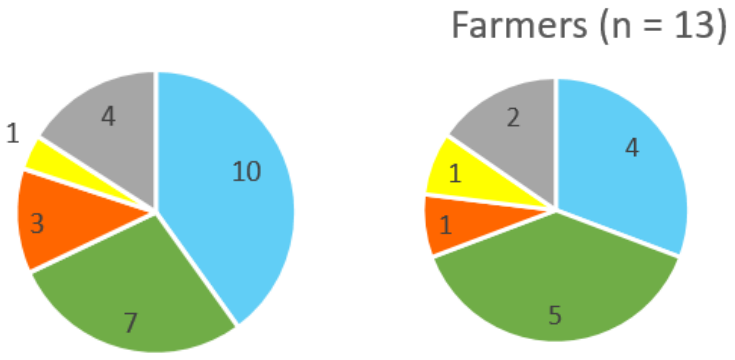
Based on these results the pig welfare self-assessment tool (PIGLOW app) will make use of **differentiated scorings systems** whenever appropriate, based on clear and unambiguous definitions for each single score.

3. What would be a realistic duration of a self-assessment for you to use the tool?

FATTENING PIGS



SOWS



Based on these results and the experience of the scientific experts (with existing tools), the PIGLOW app will be developed to allow a scan of **approximately 90 minutes**, as a robust thorough assessment cannot be accomplished in 60 minutes.

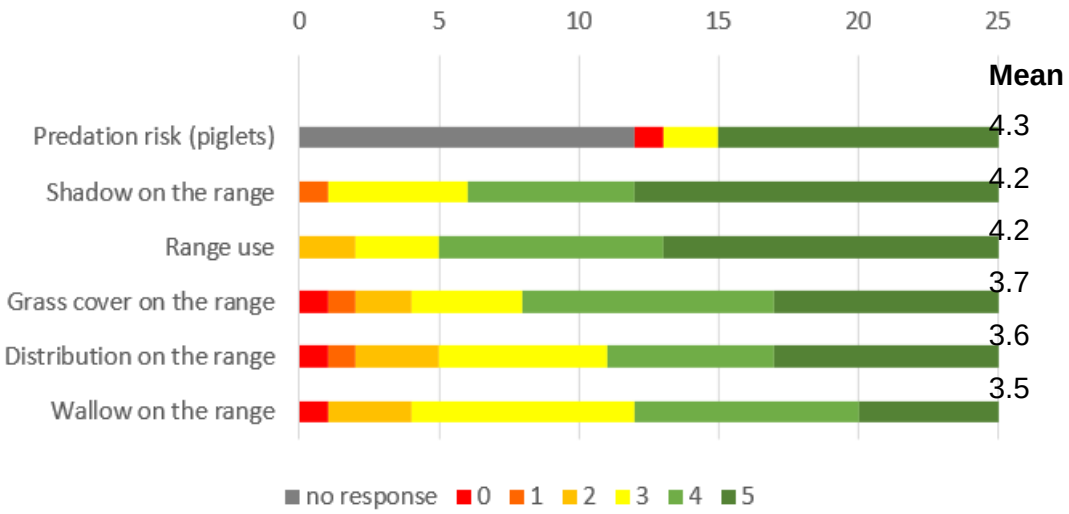
4. What would motivate you as a farmer to use/test such a self-assessment tool?

- improve the system and being able to put myself in question (2)
- assess the impact of management practices changes on welfare (2)
- improve performances (1)
- identify potential blind spots (1)
- demonstrate the appropriateness of the system and convince other producers (1)
- objective indicator, financial bonus /kg carcass, valorization of a welfare indicator for a better sector image (1)
- it is important to know if vet is needed (1)
- would be interested to use such a tool (1)

➢ OUTDOOR USE (RANGE)

1. How important does it seem to you to observe the following indicators?

Scale: Not important at all **0 → 5** Very important



2. Any other ideas of relevant welfare indicators for "systems with access to range" to add?

Outdoor area (range):

- Number of animals/ha of outdoor area (2)
- State of outdoor area (not too wet, well drained areas, …)

General:

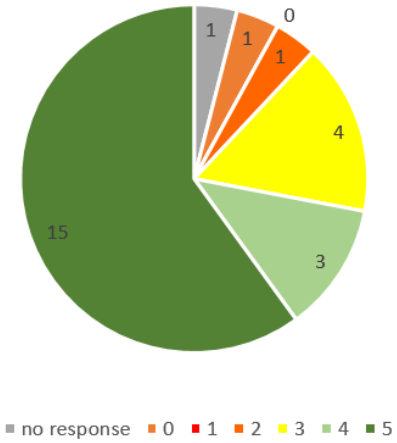
- Taking into account: climate conditions (impact on animal behaviour)
- Taking into account: time-interval between scan and first grouping of the animals (impact on animal interactions)
- Tail docking
- Tail biting
- Good fodder, enough water, health, temperature control

Based on these results and the experience of the scientific experts, the PIGLOW app will include both **animal-based** welfare indicators "**range use**" and "**distribution on the range**" to assess the outdoor use (range) as these are believed to be more directly related to the actual welfare status than resource-based indicators. Additional indicators will be scored by the trained observer during the longitudinal study (WP 3 Task 3.2).

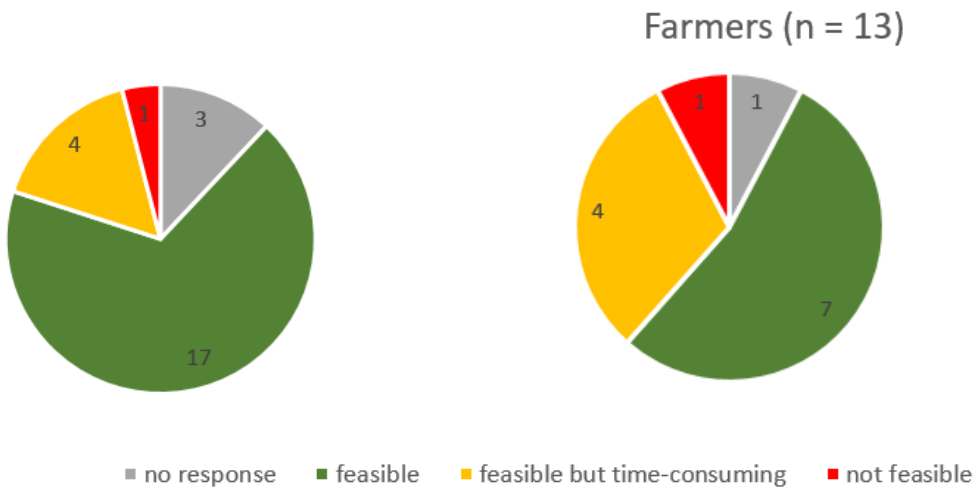
➢ DEPOPULATION (LOADING)

1. Is it important to collect animal welfare indicators on the depopulation part with the app?

Scale: Not important at all **0 → 5** Very important

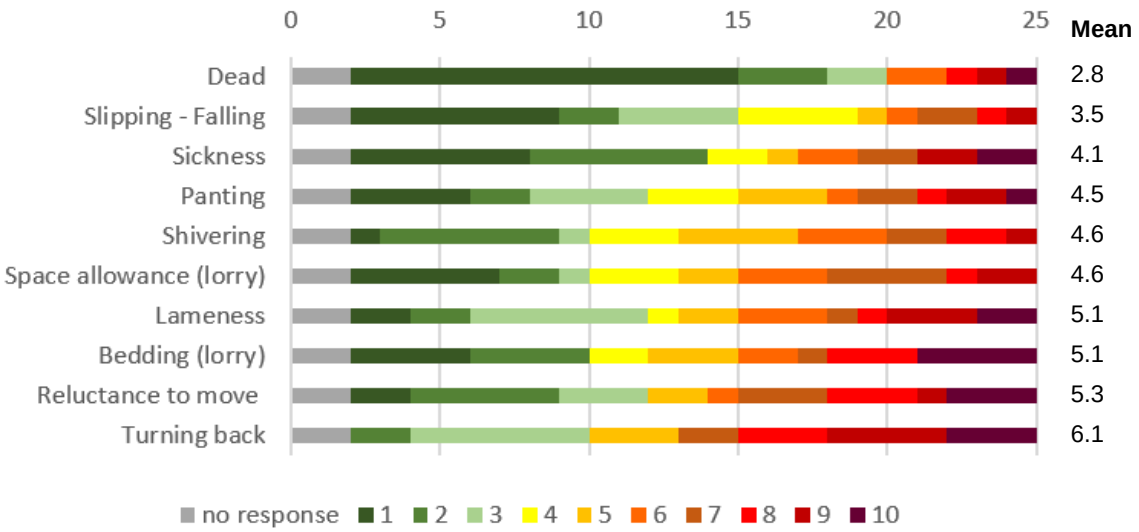


2. Is it feasible to collect animal welfare indicators on the depopulation part with the app?



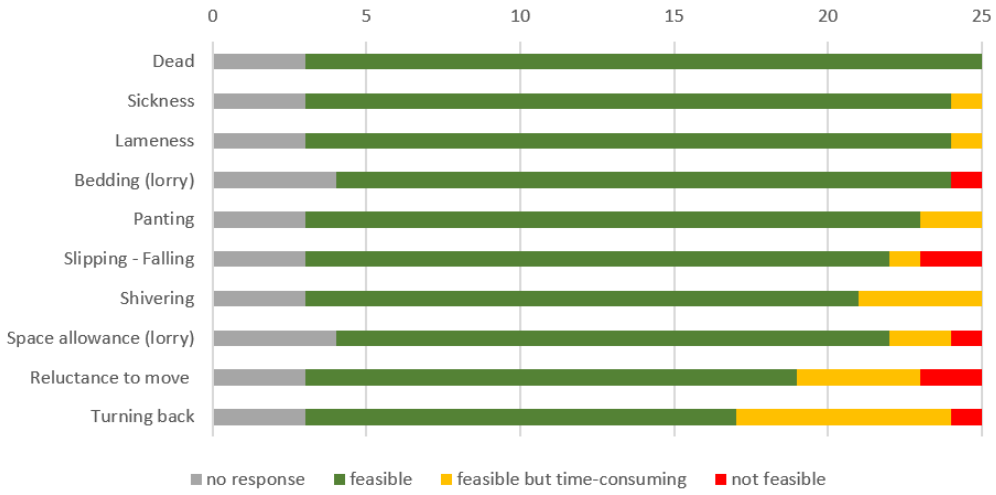
3. Rank the welfare indicators from most important one to consider to least important.

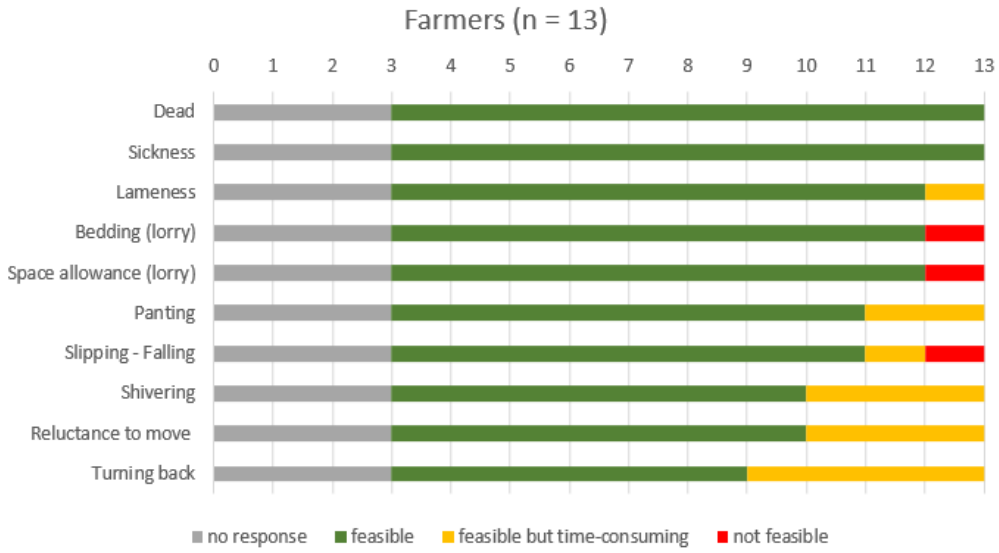
Scale: most important **1 → 10** least important



4. Indicate whether the welfare indicators are feasible to score

Scale: feasible – feasible but time-consuming – not-feasible





5. Any other ideas of relevant indicators to add?

- presence of a "waiting room" before loading (*dilute* the stress of transportation) (1)
- loading ramp or lift (1)
- mixing (or not mixing) different lots (1)
- the tool should include transport (3) and slaughter house (2):
  - transport duration (1)
  - fasting duration (1)
  - duration before stunning (1)
  - meat quality indicating stress prior death (1)
  - abrupt ride of the lorry driver (1)
  - electric shock use by the lorry driver (1)
- enough salt supplements, toys, flooring quality (1)

Based on these results and the experience of the scientific experts, the PIGLOW app will:

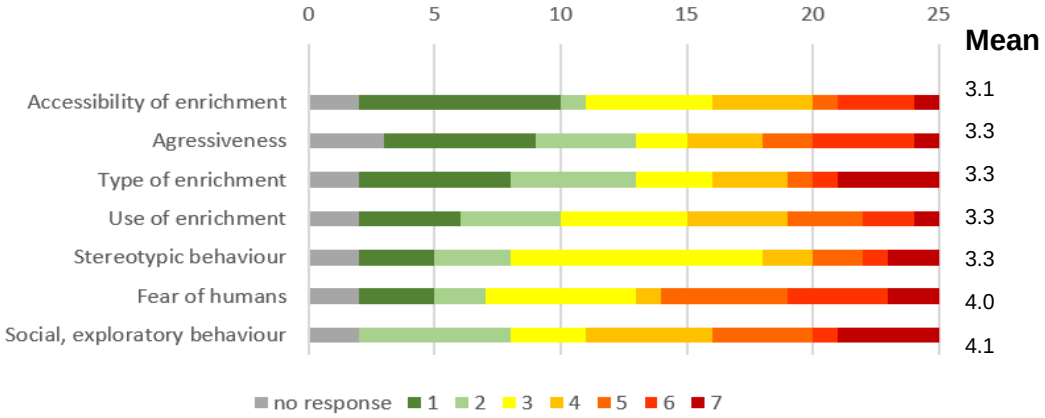
- exclude both **resource-based** welfare indicators "**space allowance**" and "**bedding**" of the **lorry** to assess the depopulation process as animal-based indicators are believed to be more directly related to the actual welfare status,
- exclude "**dead**" animals as during depopulation no dead animals are assumed to be present,
- include "**access to water**" (during waiting), "**maximum duration of water deprivation before loading**" and whether the pigs are "**mixed**" or left in stable groups prior to / during loading.

➢ FATTENING PIGS

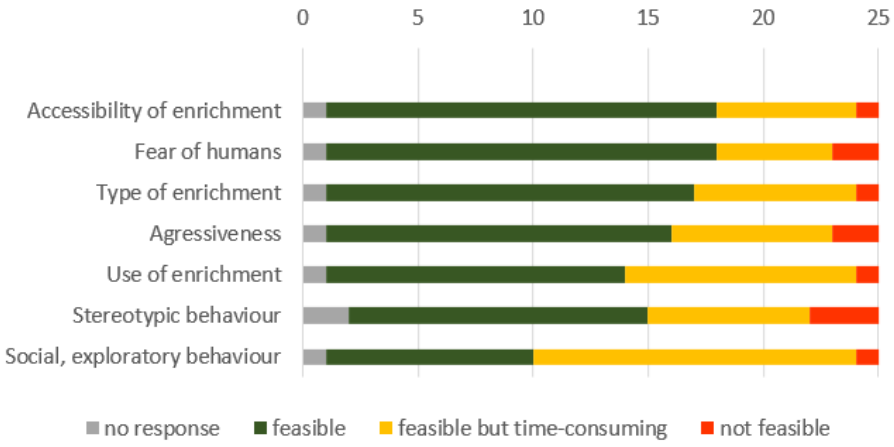
1. **Rank** (per welfare principle) the indicators from **most important** one to consider (**number 1**) to **least important** (**highest number**)
2. Indicate whether the welfare indicators are **feasible** to score

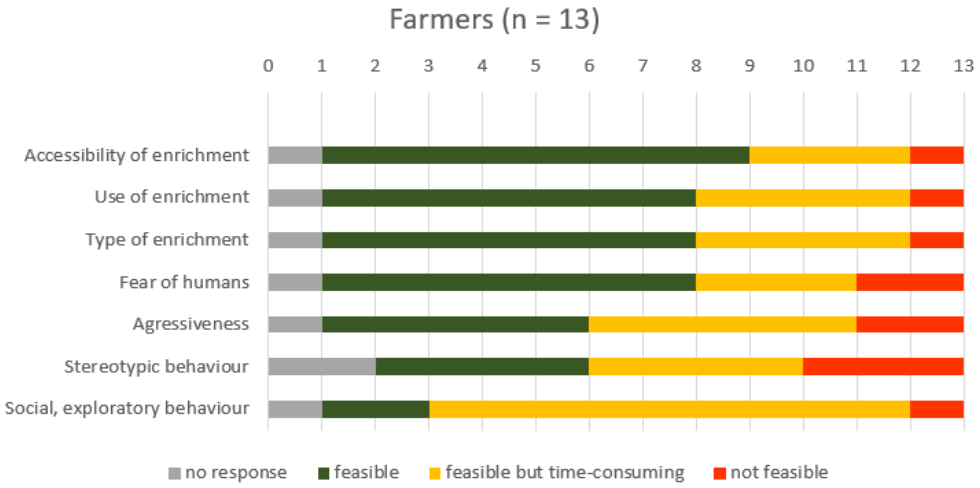
APPROPRIATE BEHAVIOUR

Scale: most important **1 → 7** least important



Scale: feasible – feasible but time-consuming – not-feasible





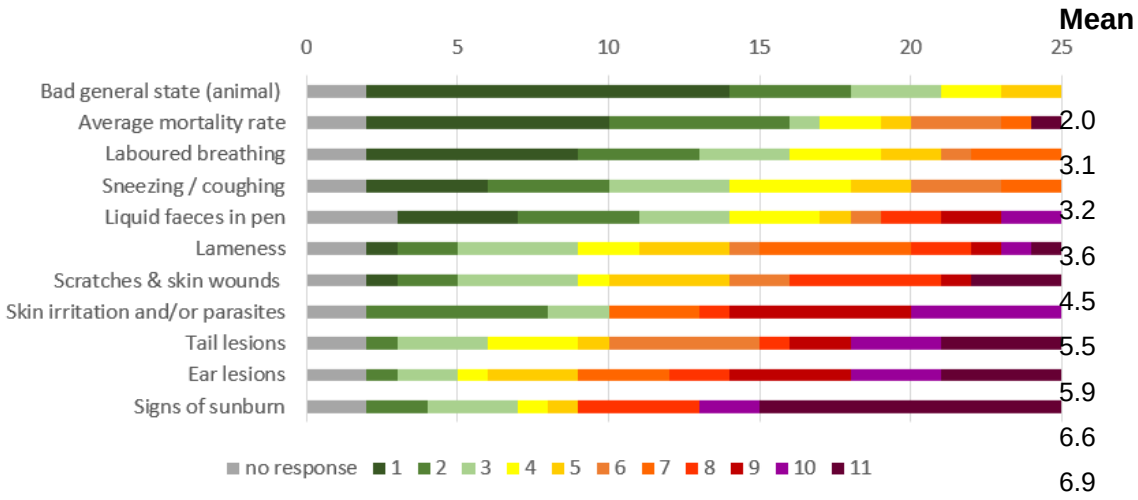
Based on these results and the experience of the scientific experts, the PIGLOW app will:

- exclude the **resource-based** welfare indicator "**accessibility of enrichment**" as animal-based indicators are believed to be more directly related to the actual welfare status,
- exclude "**social, exploratory behaviour**" and "**stereotypic behaviour**" as these are very difficult to assess in a short time-slot by the farmer, and the main redirected or abnormal behaviour in fattening pigs (i.e. tail biting) is covered by scoring tail lesions anyway,
- exclude "**aggressiveness**" as this behaviour will be assessed by scoring skin lesions,
- include "**fear of humans**", "**type of enrichment**" and "**use of enrichment**".

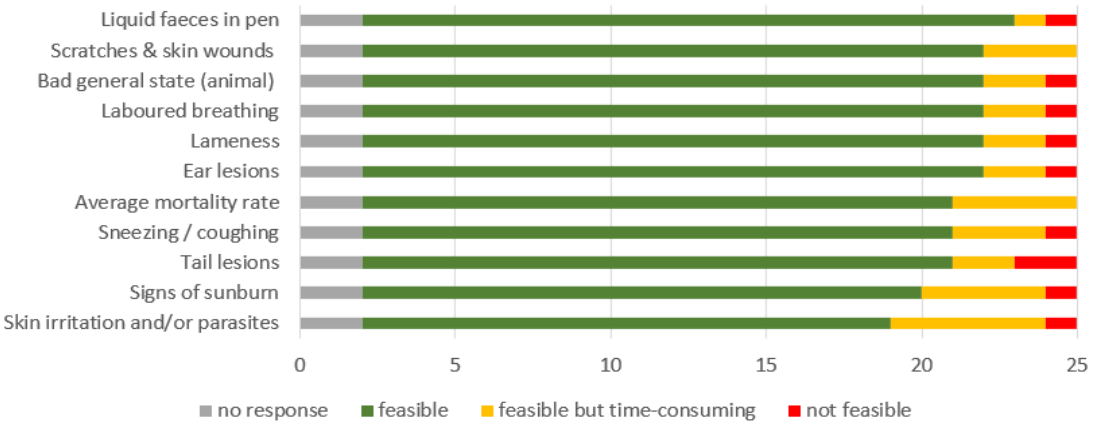
The team will explore viable options to include questions on **positive behaviour** in the self-assessment tool.

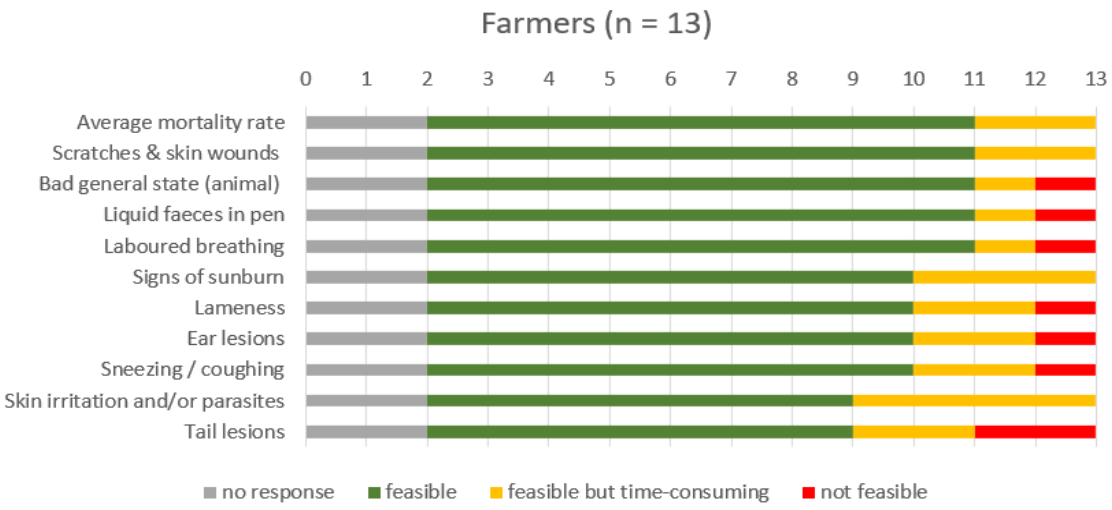
GOOD HEALTH

Scale: most important **1 → 11** least important



Scale: feasible – feasible but time-consuming – not-feasible

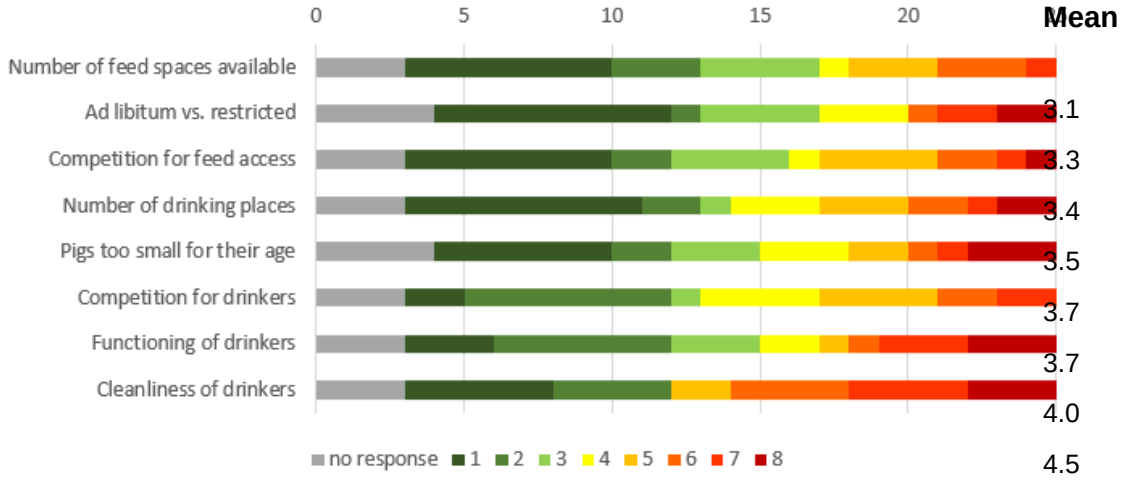




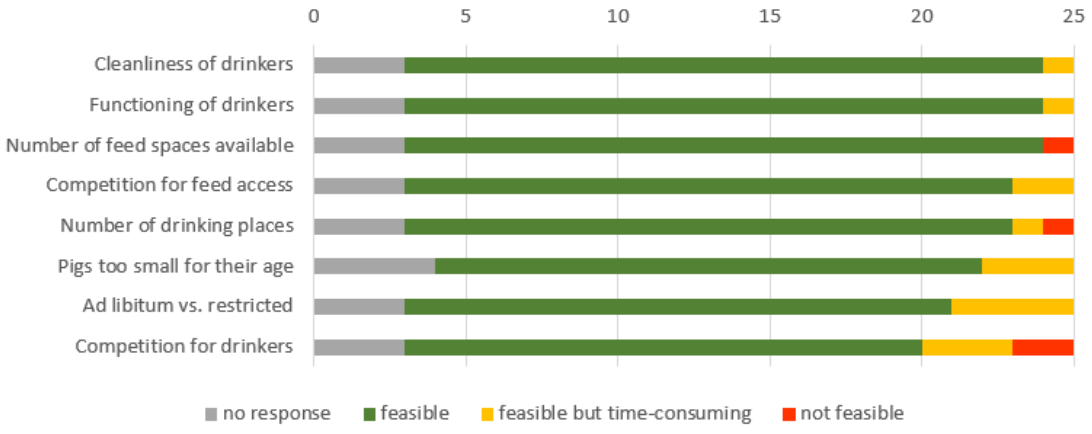
Based on these results and the experience of the scientific experts, the PIGLOW app will aim to include **all animal-based welfare indicators** (a listed above).

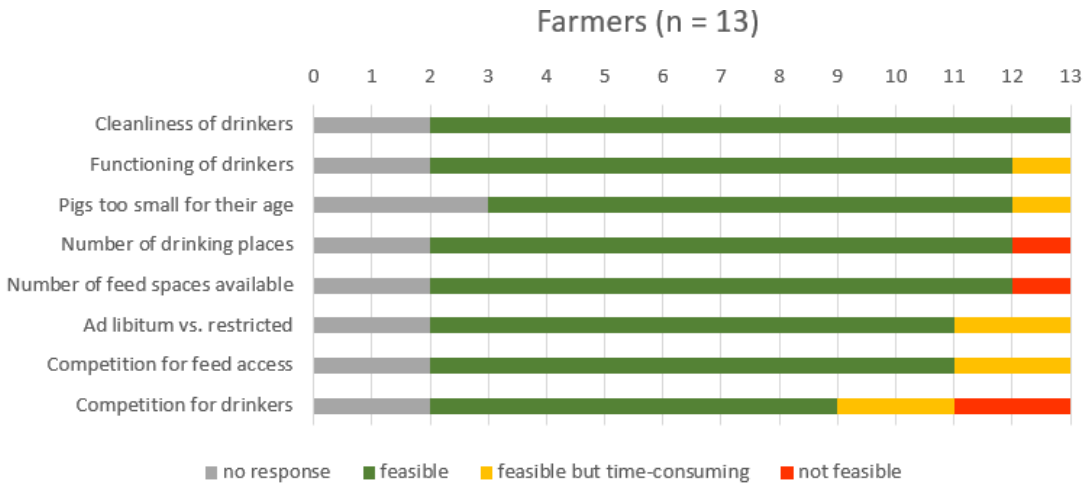
GOOD FEEDING

Scale: most important **1 → 8** least important



Scale: feasible – feasible but time-consuming – not-feasible

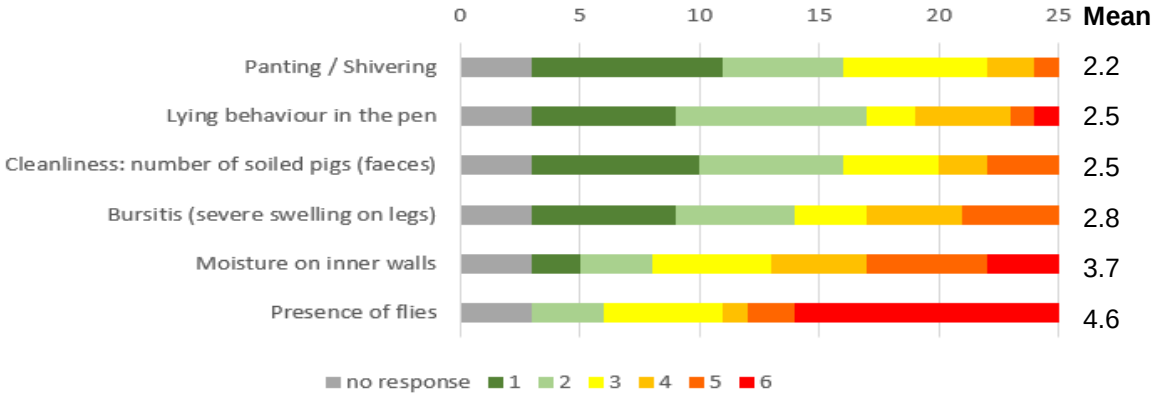




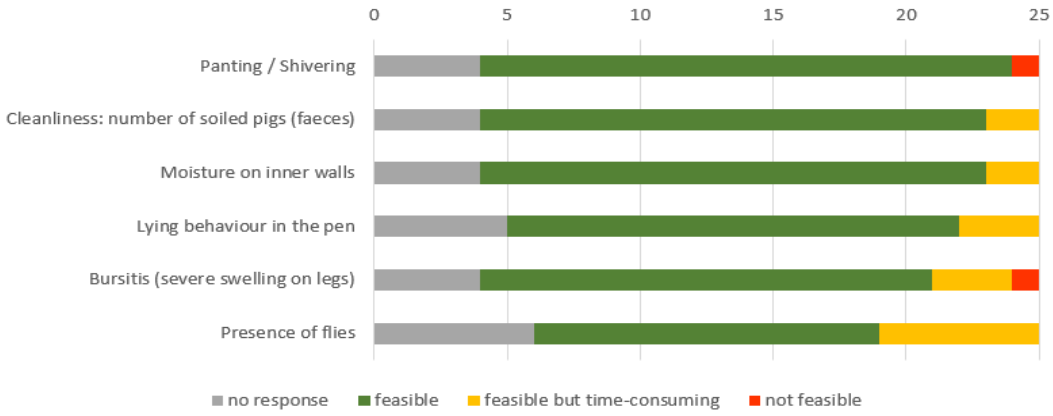
Based on these results and the experience of the scientific experts, the PIGLOW app will only include "**pigs too small for their age**" as this is the only animal-based indicator to assess good feeding, and will include the following question "**do some animals in the group might have difficulties having access to good quality drinking water at some point in time**?".

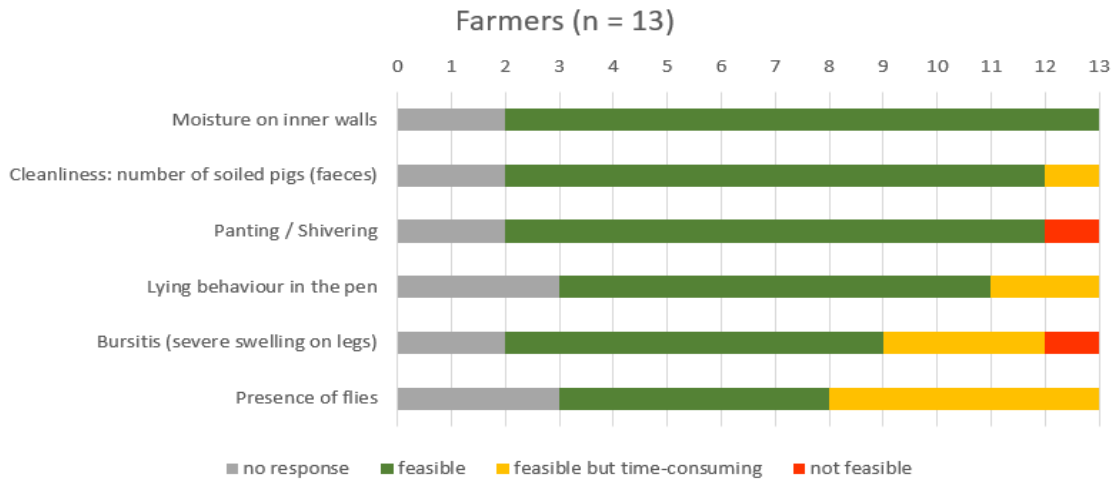
GOOD ENVIRONMENT (HOUSING)

Scale: most important **1 → 6** least important



Scale: feasible – feasible but time-consuming – not-feasible

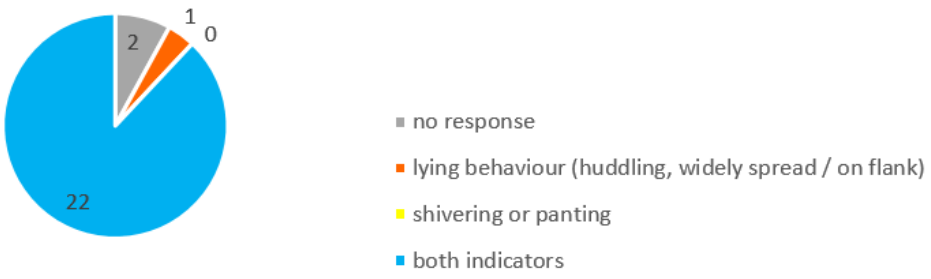




Based on these results and the experience of the scientific experts, the PIGLOW app will:

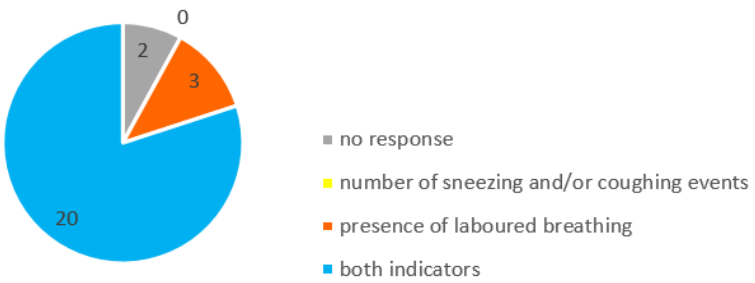
- exclude the resource-based indicator "**moisture on inner walls**",
- exclude "**bursitis (severe swelling on legs)**", as this is not believed to be an indicator for comfort around resting for fattening pigs,
- exclude "**presence of flies**" as it is not possible to establish a threshold for negative effect on the welfare status of the pigs.

3. To assess thermal comfort of fattening pigs, should we look:



Based on these results and the experience of the scientific experts, the PIGLOW app will include **both indicators** to assess thermal comfort (see above).

4. To assess respiratory problems of fattening pigs, should we look for the:



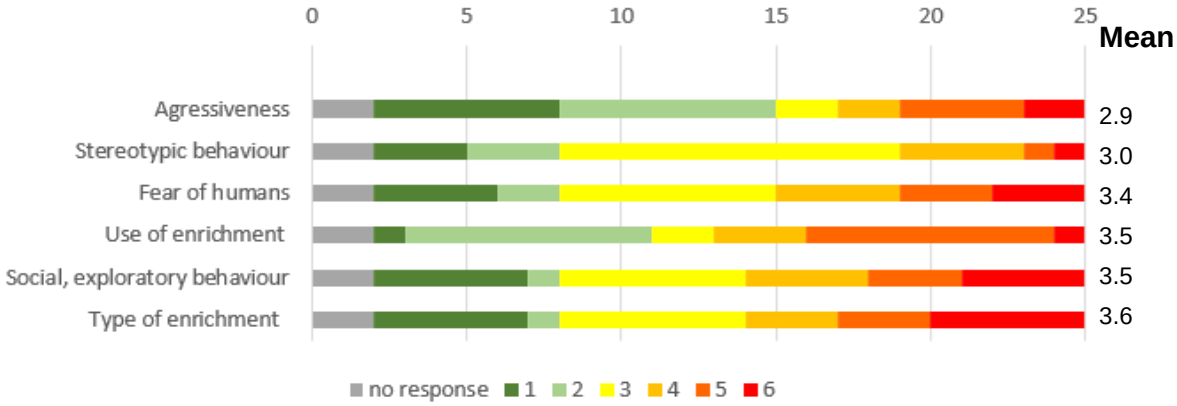
Based on these results and the experience of the scientific experts, the PIGLOW app will include **both indicators** to assess respiratory problems (see above).

➢ **SOWS**

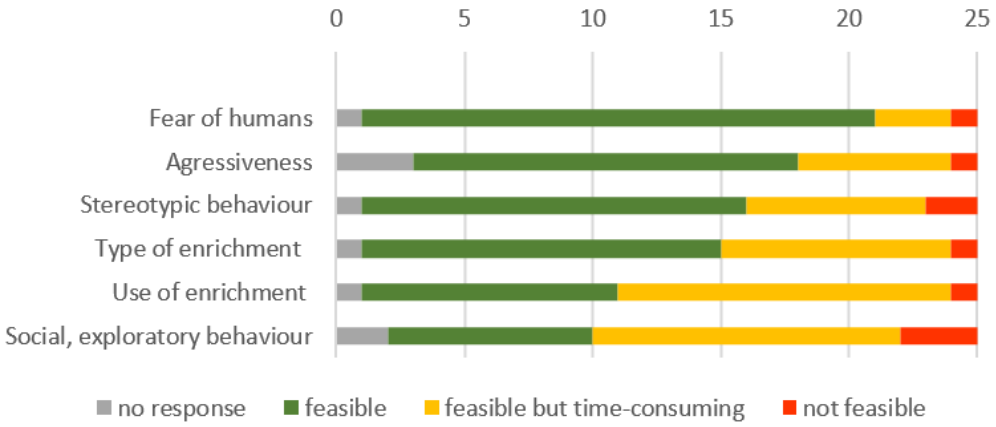
1. **Rank** (per welfare principle) the indicators from **most important** one to consider (**number 1**) to **least important** (**highest number**)
2. Indicate whether the welfare indicators are **feasible** to score

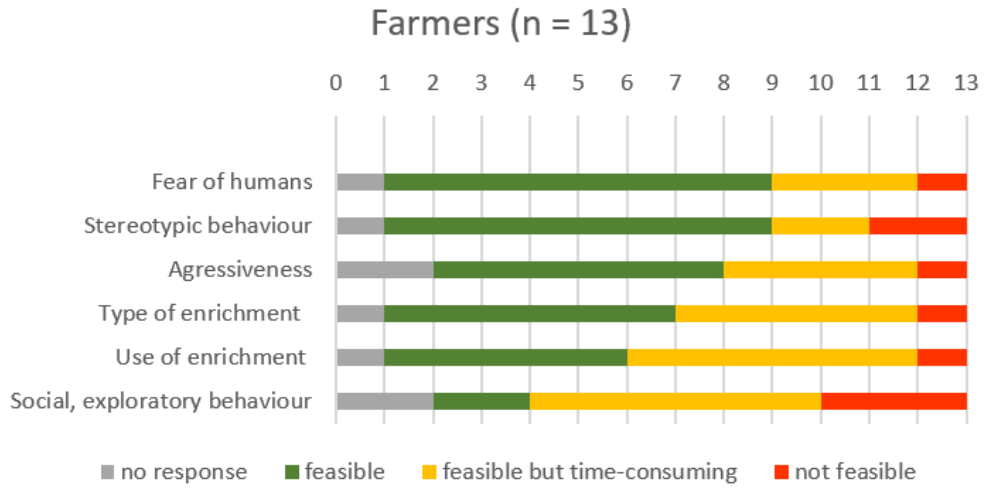
APPROPRIATE BEHAVIOUR

Scale: most important **1 → 6** least important



Scale: feasible – feasible but time-consuming – not-feasible





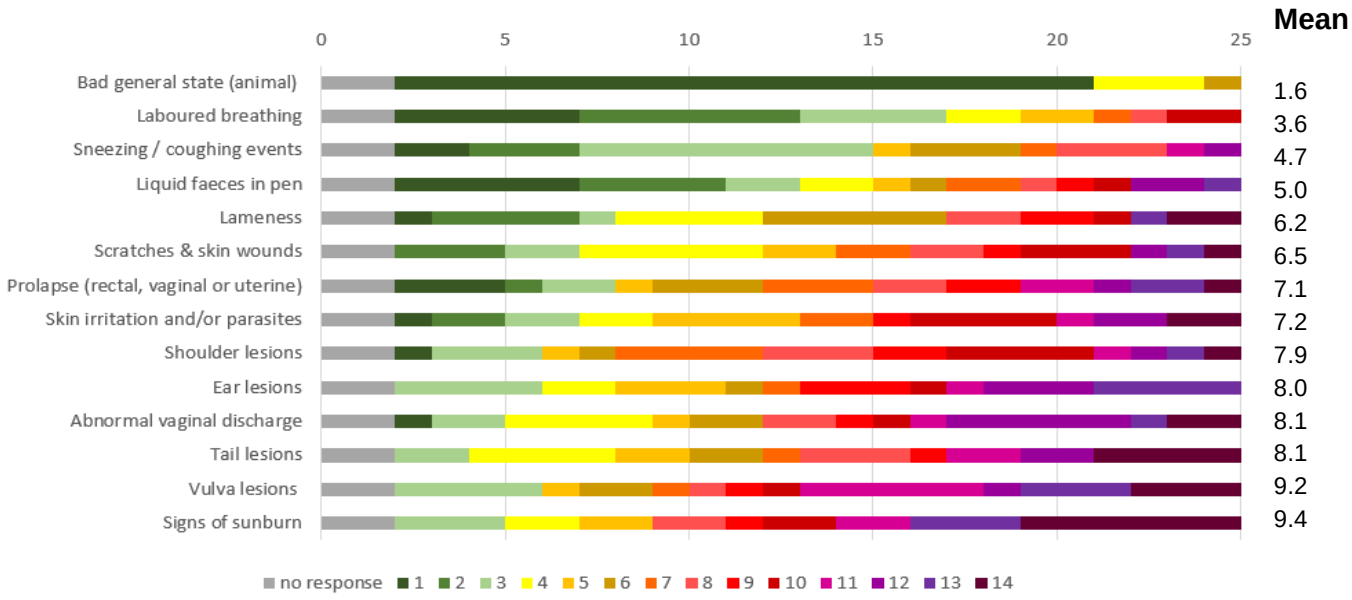
Based on these results and the experience of the scientific experts, the PIGLOW app will:

- exclude the **resource-based** welfare indicator "**accessibility of enrichment**" as animal-based indicators are believed to be more directly related to the actual welfare status,
- exclude "**social, exploratory behaviour**" as this is very difficult to assess in a short time-slot by the farmer,
- exclude "**aggressiveness**" as this behaviour will be assessed by scoring skin lesions,
- include "**sows with frothy saliva**" instead of "**stereotypic behaviour**" as this indicator is more straightforward to score,
- include "**fear of humans**" for the gestating (pregnant) sows, "**type of enrichment**" and "**use of enrichment**".

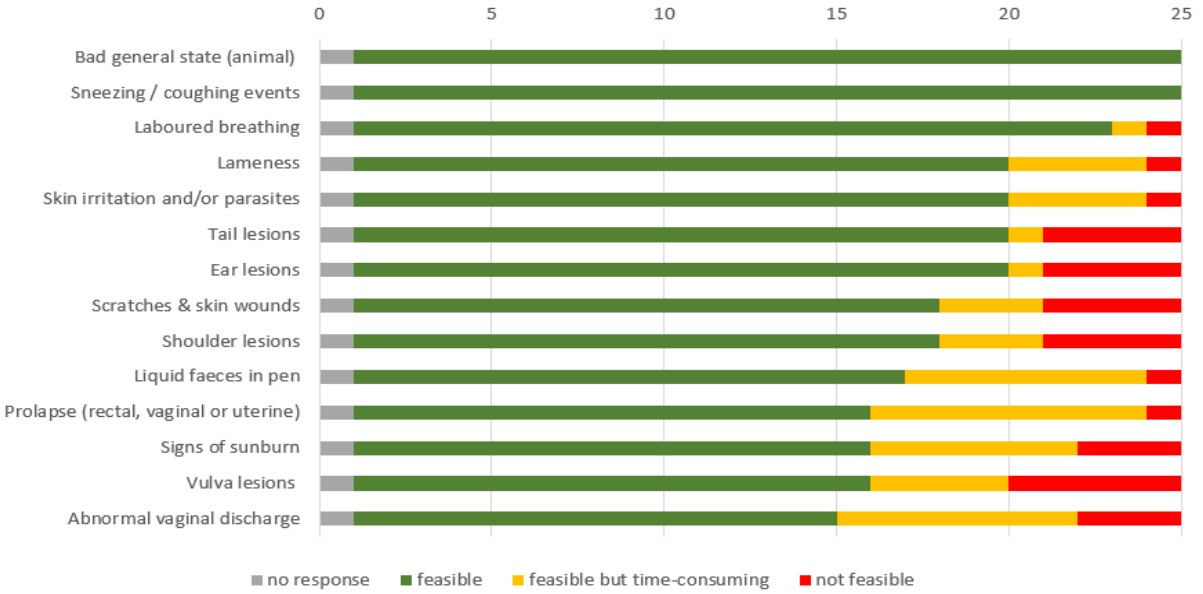
The team will explore viable options to include questions on **positive behaviour** in the self-assessment tool.

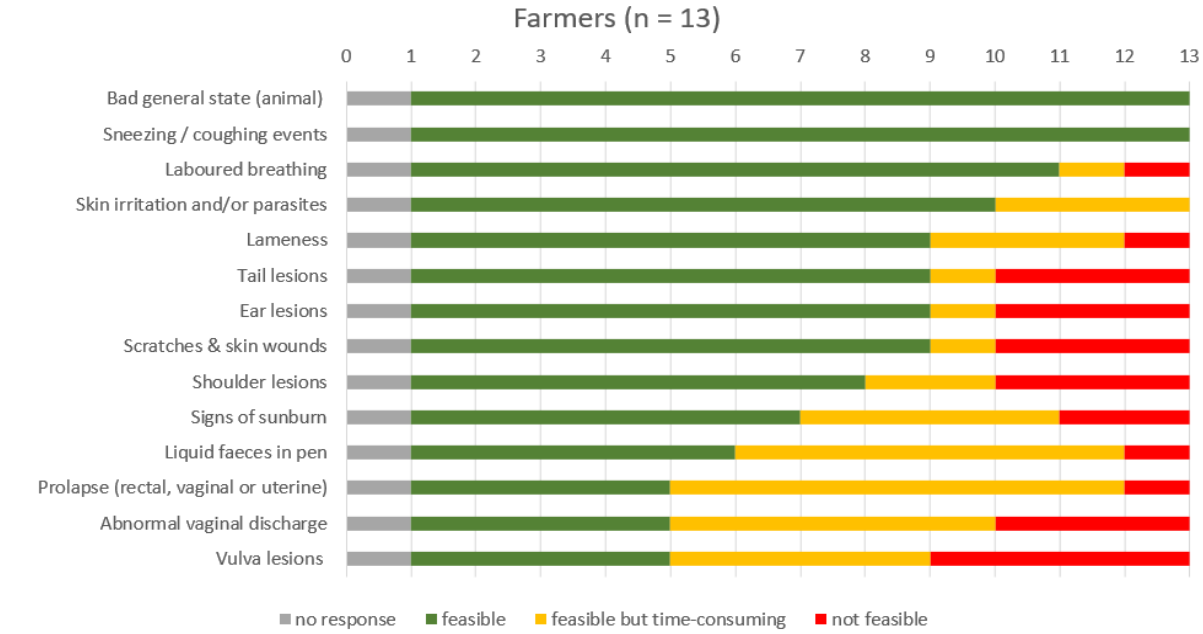
GOOD HEALTH

Scale: most important **1 → 14** least important



Scale: feasible – feasible but time-consuming – not-feasible

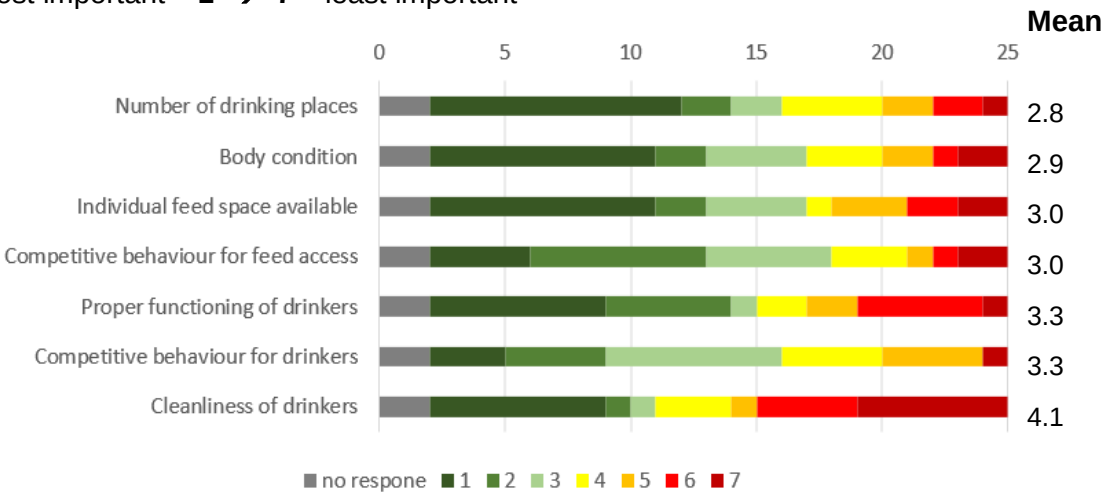




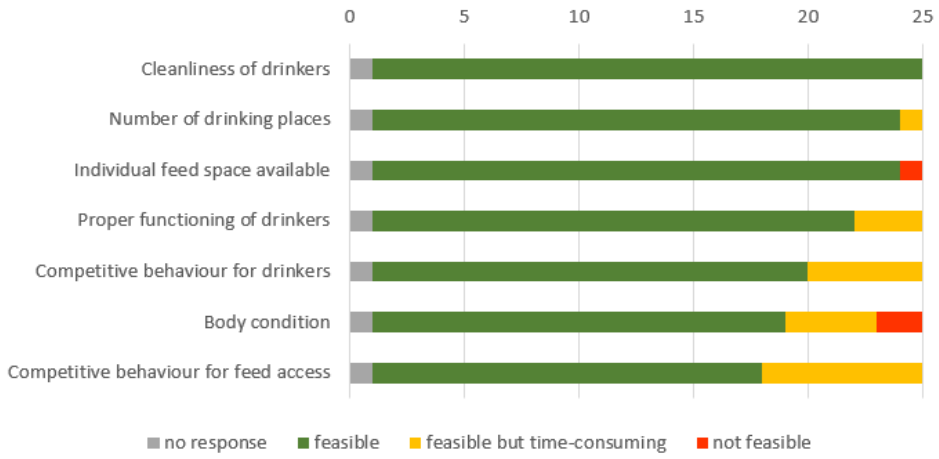
Based on these results and the experience of the scientific experts, the PIGLOW app will aim to include **all animal-based welfare indicators** (a listed above).

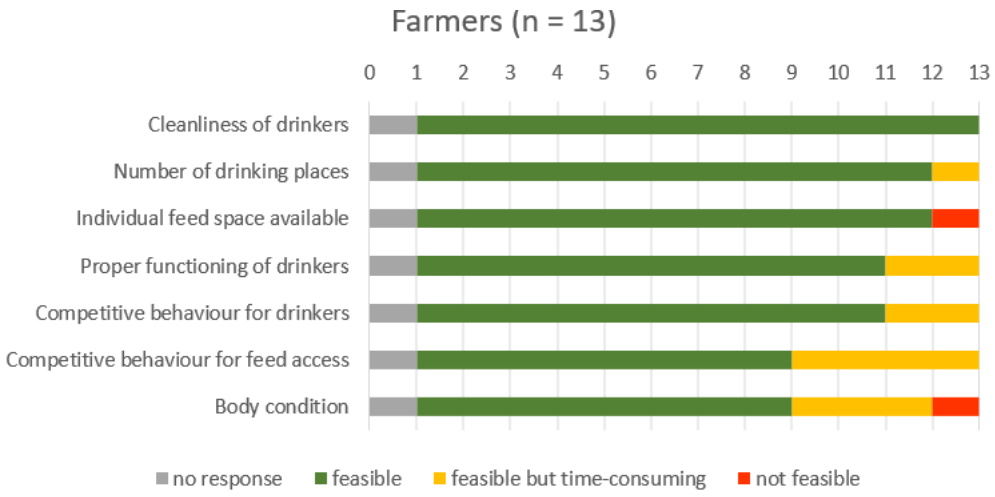
GOOD FEEDING

Scale: most important **1 → 7** least important



Scale: feasible – feasible but time-consuming – not-feasible



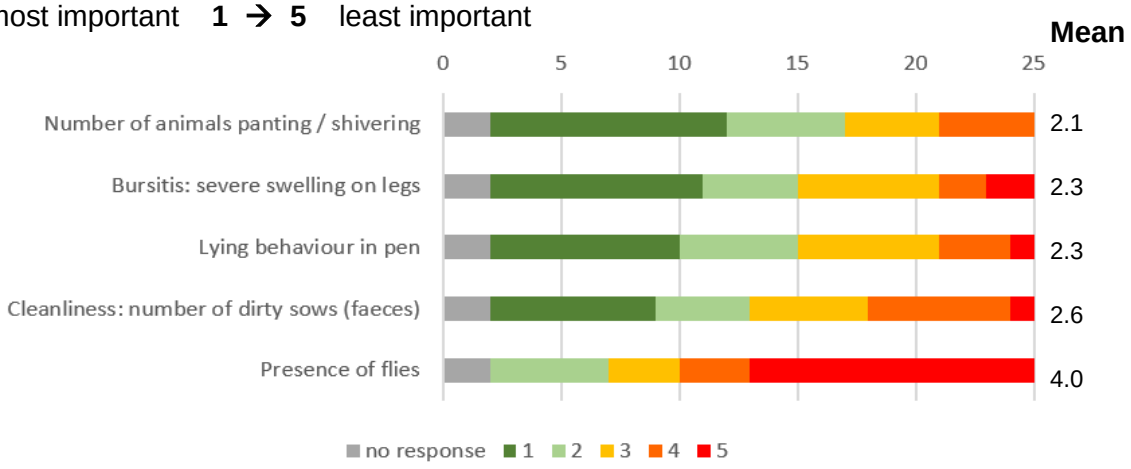


Based on these results and the experience of the scientific experts, the PIGLOW app will only include "**body condition**" as this is the only animal-based indicator to assess good feeding and will

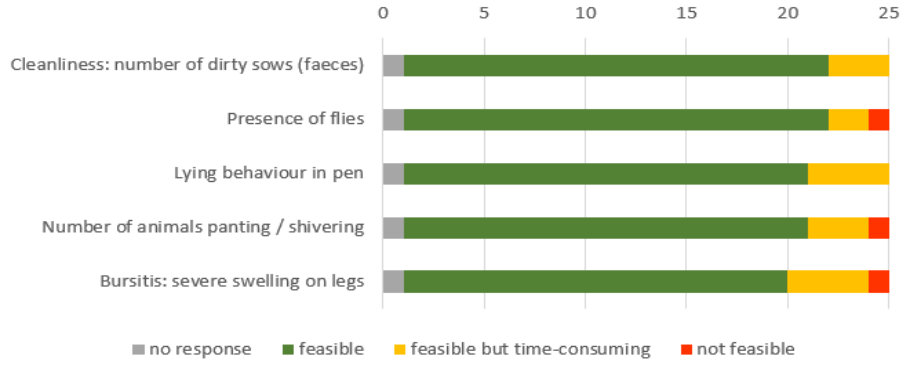
include the following question "**do some animals in the group might have difficulties having access to good quality drinking water at some point in time**?".

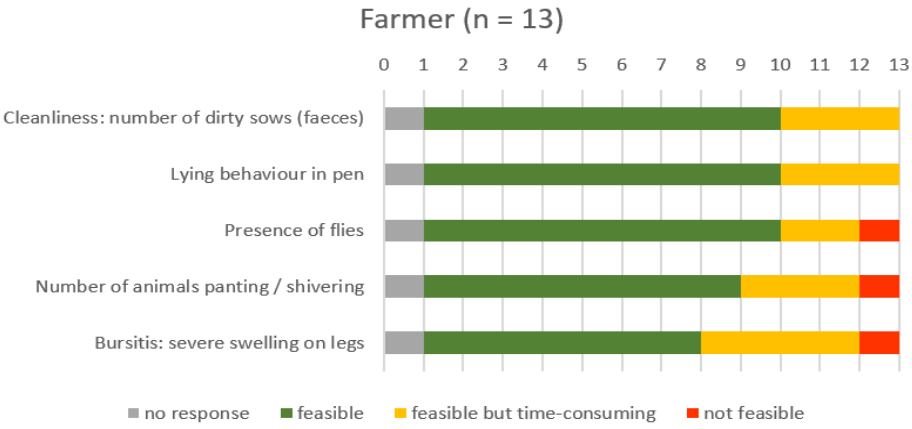
GOOD ENVIRONMENT (HOUSING)

Scale: most important **1 → 5** least important



Scale: feasible – feasible but time-consuming – not-feasible





Based on these results and the experience of the scientific experts, the PIGLOW app will exclude "**presence of flies**" as it is not possible to establish a threshold for negative effect on the welfare status of the pigs.

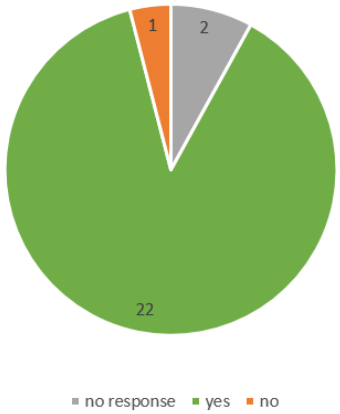
3. To assess thermal comfort of sows and piglets, should we look:

– at the lying behaviour (“huddling” or ”widely spread / on their flank”)?
– whether animals are shivering or panting?
– use both indicators?

Based on these results and the experience of the scientific experts, the PIGLOW app will include **both indicators** to assess thermal comfort (see above).

4. **Do you think it is relevant to identify sows which are “too fat” as a welfare indicator?** (in addition to the sows which are too lean)

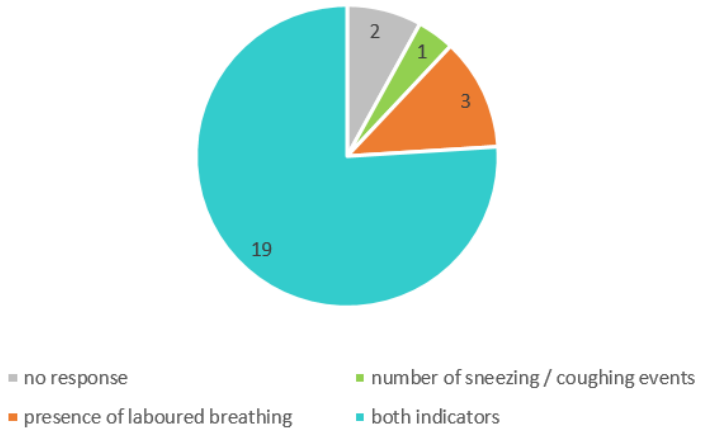
– Yes (“too fat” is also relevant)
– No (“too fat” is not relevant)



Based on these results and the experience of the scientific experts, the PIGLOW app will ask the farmer to record both: sows which are “**too lean**” and sows which are “**too fat**”.

5. To assess respiratory problems of sows, should we look for the:

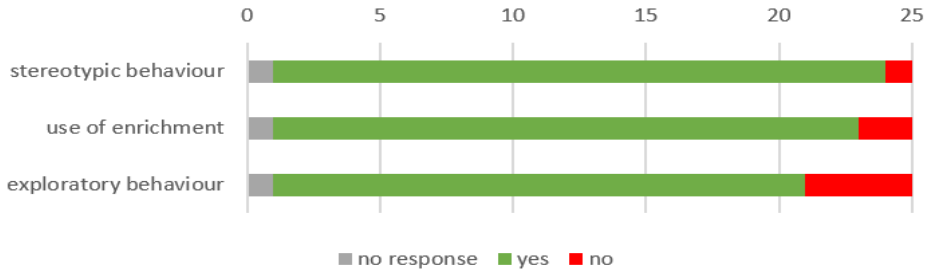
– number of sneezing and/or coughing events (during 2 minutes)?
– presence of laboured breathing?
– use both indicators?



Based on these results and the experience of the scientific experts, the PIGLOW app will include **both indicators** to assess respiratory problems (see above).

6. Do you think the following welfare indicators are relevant to score for <u>farrowing</u> sows?

- stereotypic behaviour: Yes (relevant) No (not relevant)
- exploratory behaviour: Yes (relevant) No (not relevant)
- use of enrichment: Yes (relevant) No (not relevant)



Based on these results and the experience of the scientific experts, the PIGLOW app will:

- exclude "**social, exploratory behaviour**" (see above)
- include "**use of enrichment**" and "**sows with frothy saliva**" instead of "**stereotypic behaviour**" as this indicator is more straightforward to score

The team will explore viable options to include questions on **positive behaviour** in the self-assessment tool.

7. Do you have any suggestions of other welfare indicators that could be used for outdoor or extensive systems?

- % insemination success, re-breeding period, number of piglets/sow (alive, stillbirths, mummified), % mortality in piglets, % mortality in sows (1)
- good productivity indicators (1)
- disponibility and use of materials allowing rooting and/or nesting (1)
- fetophagia, pododermatitis, abortions (1)
- available toys, flooring quality (1)

Based on these results and the experience of the scientific experts, the PIGLOW app will include "**piglet mortality**". "**Abortions**" will not be included as it is very difficult to get comparable data for this indicator.

F. Information and consent forms for the on-farm visits

➢ Poultry

Information form for participants of the welfare self-assessment apps testing

Title of the project: PPILOW 'Poultry and PIg Low-input and Organic production systems' Welfare'

Coordinator: Institut National de Recherche pour l'Agriculture, l'alimentation et l'Environnement (INRAE)

Funding: The PPILOW project aiming at improving the welfare of pigs and poultry in low-input outdoor and organic production systems has received funding from the European Union Horizon 2020 'Research and Innovation' Programme under Grant Agreement No. 816172. The information provided reflects the views of its authors. The Executive Agency for Research of the European Commission cannot be held responsible for the use of the information provided.

Introduction:

XXX (ITAVI, ILVO or UU) offers to participate in a research project to test on-farm welfare assessment tool for poultry: EBENE®. The demonstration of the EBENE® app will be performed by *XXX (surname and first name, email and telephone, position, affiliation and postal address)(eventually)* eventually assisted by *YYY (Organism, title)*. The legal basis for this project is the performance of a public interest task requiring your consent in accordance with the general European Data Protection Regulation n° 2016/67.
Before deciding to take part in this research project, please take the time to read the following information. You can take the time you need to decide whether or not to participate in this research, for which you are free to agree or refuse to take part. If you do agree you may also choose not to answer all the questions put to you, or at any time stop contributing without having to explain why.

Context of the PPILOW research project:

The purpose of the project is to co-construct, through a multi-actor approach, innovations to improve the welfare of poultry and pigs reared in low-input outdoor and/or organic farming systems. This project gathers 23 contractually-engaged partners (Grant Agreement n°8161172 signed with the European Commission, Consortium Agreement version 2019-04-25 signed among project partners).
To improve welfare level of poultry and pigs on farm, INRAE (former INRA, France) is leading the PPILOW European project on animal welfare in organic and free-range production systems (www.ppilow.eu). Tools were developed or refined for poultry and pig welfare assessment according to practitioners' feedback and we would like to present you the current version of the apps to be sure there is no major remaining issues. The study will be conducted by an international team of researchers from different partner institutes (ILVO, CRAW, ACTA – ITAVI and Universiteit Utrecht) on farms in Belgium, France and The Netherlands. Up to 10 farmers will be surveyed (2 to 3 in each country), once between May and August 2020. If you choose to participate, we thank you for agreeing to give your opinion in the 'PPILOW' project.

The usefulness of the data collected in achieving the aims of this research project:

You will have the possibility to contribute to the improvement of the welfare self-assessment apps by providing us your opinion on it. One on-farm visit will be organized between you and researcher(s) to perform a welfare assessment together (on the researcher smartphone or directly on your smartphone, with a temporary account dedicated to this trial). Then, a few questions will be asked to collect your opinion on e.g. ergonomic aspects, relevance of indicators. Your answers will be taken into account as far as possible to refine the apps after discussions within Ppilow partners and app developers.

Participant selection

We received your contact details from the PPILOW National Practitioners Group based on expressed interest in volunteering to participate in this study.

Information on the EBENE® app:

EBENE® is a tool enabling users (mainly farmers, veterinarians and technicians) to carry out an assessment of the welfare of poultry flocks (chicken, turkey, guinea fowl), layers (ground and/or grazing) or rabbits, based on a methodology developed during successive research programs by the Technical Institute of Poultry.

The tool allows:
- to raise awareness of animal welfare issues among users, in particular poultry and rabbit farmers, as well as persons and companies providing advice to farmers,
- to evaluate the main welfare indicators on farms,
- to monitor the evolution over time of the level of well-being on the same farm,
- to position the results of the well-being indicators of a batch in relation to references,
- to propose ways of improving farming practices in order to further improve the welfare of farmed poultry and rabbits

Your rights regarding confidentiality and privacy:

The private data obtained will be treated with the utmost confidentiality (related to your identity, questionnaire answers and welfare data of your animals). Your identity will be dissociated from your answers, comments, inquiries and EBENE® results and correspondence with your identity will be stored in a specific spreadsheet accessible only by ILVO, CRAW, ACTA – ITAVI and Universiteit Utrecht. The information we will receive from you will be hosted by (*the organism that perform the on farm visit*). Your welfare results won't be stored on the global EBENE® database as a temporary account will be used for this trial (no results will be saved in the database). The summary of your contributions will only be sent to the European partners involved in the EBENE® app refinement without mentioning your identity or means of accessing your personal data. For publications, your identity will be protected and all data will be pseudonymized, however, please be aware that publications may include quotes mentioning your general position in the supply chain (e.g. farmer, adviser). Publication types may include reports to the European Commission and scientific papers. Relevant general outcomes may also be used to promote organic and/or free range poultry productions in specific websites. The private data will not be transmitted to any other recipient, nor used in any context other than that described above. By default, it is prohibited to communicate private data to an undisclosed recipient (except authorized third parties).

This information will be kept, under the best conditions of security and confidentiality, for the entire duration of the research project, i.e. 5 years and the following 5 years, by *XXX and YYY* and will possibly be reused for contacting you for a subsequent project related to the topic, if you consent. At the end of this period, the information collected is intended to be archived, in accordance with the law, in a pseudonymized form, i.e. without any possibility of access to your identity.

Your rights regarding your questions:

You can ask questions about the research project at any time (before, during and after your participation) by contacting *Laura Warin* by email at *warin@itavi.asso.fr (or by phone at +33 2 47 42 78 36)*. In the event of unavailability, you can contact *Frank Tuyttens* at the following address*: frank.tuyttens@ilvo.vlaanderen.be.*

Your right to withdraw from the study at any time:

In accordance with the European Regulation on the protection of personal data and the National Data Protection Act, you have the right to access, rectify, oppose and delete information concerning you. Unless you object, the personal data collected during this research project may be the subject of a subsequent research project with a similar research purpose. If you oppose further use of your data, all of your data (personal and knowledge provided within the group) will be deleted at the end of the project.
If you wish to exercise these rights and/or obtain information about yourself, please contact *XXX (xxx@xxx) or YYY (yyy@yyy) – contact person who conducted the on-farm visit.* Your decision to participate, refuse to participate, or cease participation will not affect future relationships with *(organism(s) involved in the on-farm visit).*

Plausible risks associated with the study:

The results of the studies might be widely disseminated, and it is advised not to communicate on welfare results without prior asking to your contact at ILVO, CRAW, ACTA – ITAVI and Universiteit Utrecht.

Expected benefits of the study:

You will have a feedback of the final improvements of the EBENE® app. Moreover, thanks to this on-farm demonstration, you will be trained to use the EBENE® app to assess the welfare of your poultry alone. If you want to, you may create a user account. This account creation must be done on the EBENE® mobile application. When creating the account, you will be asked to create a login (email address) and define a password. You can also select a company (production organization, veterinary practice, etc...) with which you wish to share your evaluations.

Access to the basic functionalities of the mobile application and website, after creating an account, is free of charge. Access to the paid functionalities is subject to the subscription of a specific license.

In the event of loss or theft of your password, you will inform the Technical Institute of Poultry by sending an email to contact_EBENE@itavi.asso.fr.

If you are willing to be part of the longitudinal study that will take place from September, 2020 on broilers, you will have priority. This study involves the use of the app on several flocks to identify lever of improvements to implement, and to assess their impact on the welfare scores calculated in the EBENE® app. However, we would kindly ask you to select the company "Ppilow Project" when creating your EBENE® account so that the welfare data collected on your animals will be accessible by *ITAVI – Laura Warin and ILVO – Evelien Graat* for research purposes. These welfare data will then be pseudonymised prior any analysis of file sharing with Ppilow project partners. Only the database manager, OnePoint, will have access to your data.

Dissemination:

This research will be disseminated in conferences, meetings with practitioners, videos, e-learning, project website and published in conference proceedings and academic journal articles.

XXX (unit/dpt of the facilitator) is accompanied by the Personal Data Protection Officer (*DPO, if any)* or the person who is responsible for data security and storage of its supervisory institution. His contact details are *Address; Tel: xxxx ; E-mail: xxx@yyy.*

2- Consent form

To guarantee your privacy rights, we ask you to give your explicit consent (tick the corresponding boxes):

	Thanks to tick the box	
	Yes	**No**
8- I hereby certify that I have read the information on the PPILOW research project mentioned above and that I have obtained the answers to my questions	☐	☐
9- I have had the necessary time to reflect on my involvement in this study and I am aware that my participation is entirely voluntary	☐	☐
10- I agree to take part to the on-farm trial to give my opinion on the EBENE® app	☐	☐
11- I agree to be photographed during the on-farm trial and that my image may be published on the project website or other communication or dissemination means. The pictures will be stored by *XXX (organism)* until 5 years after the end of the project (until August 2029).	☐	☐
12- I accept that so-called sensitive information concerning my own welfare with regard to that of farmed animals may be collected during the questionnaire	☐	☐
13- I agree that all the information collected in the context of this group may be published in publications as pseudonymized quotes (without my surname and first name being mentioned).	☐	☐
14- I agree that my personal data collected through this project may be the subject of a subsequent project to refine or consolidate the research outcomes resulting from this project (excluding any exploitation for commercial purposes), under the same conditions of confidentiality and security.	☐	☐

I have noted that I may withdraw my consent at any time.

Made in two original copies, one of which must be given to the volunteer by hand.

Date:

Name, first name of the project manager:

Mailing address or e-mail address:

Signature:

Name, first name of the volunteer:

Mailing address or e-mail address:

Signature:

➢ Pigs

INFORMATION FORM - Testing and offering feedback on the EBENE® welfare self-assessment app

Project: PPILOW (Poultry and PIg Low-input and Organic production systems' Welfare)

Testing the welfare self-assessment apps

Apps were developed or refined for poultry (EBENE®) and pig (PIGLOW) welfare self-assessment based on existing tool and input from practitioners. The aim of this project task is to allow pig and poultry farmers in Belgium, France and The Netherlands to test the respective app and provide the research team with feedback. If you choose to participate, we thank you for agreeing to give your opinion on the apps.

The usefulness of the collected data in achieving the aims of this research project

You will have the possibility to contribute to the improvement of the welfare self-assessment apps by providing us your opinion on it. One on-farm visit will be organized between you and researcher(s) to perform a welfare assessment together on your smartphone, with a temporary account dedicated to this trial. Then, a few questions will be asked to collect your opinion on user friendliness, feasibility, comprehension and the relevance of indicators. Your feedback will be taken into account as much as possible to refine the apps after discussions with PPILOW partners and app developers.

Participant selection

We received your contact details from the PPILOW National Practitioners Group based on expressed interest in volunteering to participate in this study.

Information on the PIGLOW app

The PIGLOW app was developed by EV ILVO as a welfare self-assessment app for farmers to evaluate the welfare of pigs in organic and free-range systems. The tool primarily includes animal-based indicators (e.g. related to body condition, injuries, free range use). Additionally, key questions on management, housing and production parameters are included for customized/tailored benchmarking. After online submission of a completed scan, the farmer will receive instant automated feedback. This feedback report includes potential risk factors for identified problems, comparison with past scanning results to illustrate evolution in time, and anonymous benchmarking with comparable farms (as soon as enough data is available in the data base).

Your rights regarding confidentiality and privacy

The private data obtained will be treated with the utmost confidentiality (related to your identity, feedback and welfare data of your animals). For the testing of the PIGLOW app, only an e-mail address will be collected. This is required to create an account for the app.

After uploading the data you collected via the PIGLOW app, your e-mail address will automatically be replaced by a unique artificial identifier (or pseudonym) prior to data processing and analysis. No e-mail addresses will – hence – be stored in the data base. All data that is collected in the PIGLOW app during the test phase will not be used for analysis and will be deleted from the database. Only the feedback you provide on the app will be processed and be used to improve the app.

However, please be aware that publications may include quotes mentioning your general position in the supply chain (e.g. farmer, adviser). Publication types may include reports to the European Commission and scientific papers. Relevant general outcomes may also be used to promote organic and/or free range poultry productions in specific websites. The private data will not be transmitted to any other recipient, nor used in any context other than that described above. By default, it is prohibited to communicate private data to an undisclosed recipient (except authorized third parties).

This information will be kept, under the best conditions of security and confidentiality, for the entire duration of the research project, i.e. 5 years, and the following 5 years and will possibly be reused for contacting you for a subsequent project related to the topic, if you consent. At the end of this period, the information collected is intended to be archived, in accordance with the law, in a pseudonymized form, i.e. without any possibility of access to your identity.

Your right to withdraw from the trial at any time
If you agree to participate you may still choose not to answer all the questions put to you, or at any time stop contributing without having to explain why. In accordance with the European Regulation on the protection of personal data and the National Data Protection Act, you have the right to access, rectify, oppose and delete information concerning you. Unless you object, the personal data collected during this research project may be the subject of a subsequent research project with a similar research purpose. If you oppose further use of your data, all of your data (personal and knowledge provided within the group) will be deleted at the end of the project. If you wish to exercise these rights and/or obtain information about yourself, please contact Evelien.Graat@ilvo.vlaanderen.be. Your decision to participate, refuse to participate, or cease participation will not affect future relationships with names of PPILOW partners.

Expected benefits of testing the app
You will receive information on the final improvements of the PIGLOW app. Moreover, thanks to the on-farm demonstration, you will be trained to use the PIGLOW app to assess the welfare of your pigs by yourself. Finally, if you want to be part of the longitudinal study that will take place from September 2020, you will have priority.
This longitudinal study aims to test how effective animal welfare self-assessment via a mobile application by farmers combined with automated feedback, including anonymous benchmarking, is in improving the welfare of animals in commercial organic and low input broiler chicken and pig production systems.
In addition, we will be testing agreement in scoring of animal welfare measures between farmers and trained researchers, and we will be collecting data for the central data base that will be useful for researchers and the farming sector for documenting main animal welfare issues in low-input farming systems and for identifying differences in time or between systems.
The study will be conducted by an international team of researchers from different partner institutes (ILVO, CRA-W, BioForum, ACTA - ITAVI, Universiteit Utrecht and INRA) on farms in Belgium, The Netherlands and France.

Dissemination
This research will be disseminated in conferences, meetings with practitioners, videos, e-learning, project website and published in conference proceedings and academic journal articles.
XXX (unit/dpt of the facilitator) is accompanied by the Personal Data Protection Officer (*DPO, if any)* or the person who is responsible for data security and storage of its supervisory institution. His contact details are *Address; Tel: xxxx ; E-mail: xxx@yyy.*

In case you have any further questions on the research in the future, you can contact me.

Sincerely,
Name Researcher

7. Consent form

To guarantee your privacy rights, we ask you to give your explicit consent (tick the corresponding boxes):

	Yes	No
15- I hereby certify that I have read the information on the PPILOW research project mentioned above and that I have obtained the answers to my questions	☐	☐
16- I have had the necessary time to reflect on my involvement in this study and I am aware that my participation is entirely voluntary	☐	☐
17- I agree to take part in the on-farm trial to give my opinion on the EBENE® app	☐	☐
18- I agree to be photographed during the on-farm trial and that my image may be published on the project website or other communication or dissemination means. The pictures will be stored by *XXX (organism)* until 5 years after the end of the project (until August 2029).	☐	☐
19- I accept that so-called sensitive information concerning my own welfare with regard to that of farmed animals may be collected during the questionnaire	☐	☐
20- I agree that all the information collected in the context of this group may be published in publications as pseudonymized quotes (without my surname and first name being mentioned).	☐	☐
21- I agree that my personal data collected through this project may be the subject of a subsequent project to refine or consolidate the research outcomes resulting from this project (excluding any exploitation for commercial purposes), under the same conditions of confidentiality and security.	☐	☐

I have noted that I may withdraw my consent at any time.

Made in two original copies, one of which must be given to the volunteer by hand.

Date:

Name, first name of the researcher:

Mailing address or e-mail address:

Signature:

Name, first name of the volunteer:

Mailing address or e-mail address:

Signature:

G. Feedback from the farmers

➢ Poultry

A summary of the feedback received from the farmers after the on-farm visits is presented below.

➔ Broiler farmers (x2, France)

The App is considered useful but it may be seen as a constraint for some farmers who are not very familiar with the use of smartphone apps. It seems very important that farmers are aware that people are concerned about animal welfare = such an app is a good tool to be proactive on this topic.

Quantification of health issues: already done by farmers but useful to use an app to keep an historic record, interesting because it could help farmers to take corrective actions to improve welfare before slaughter and economic consequences.

Behavioural observations: time consuming but very important because highly linked to heath issues. Most interesting part of the assessment for one of the farmer, but too time consuming for the other farmer.

Historic: very useful to compare previous assessments to current ones but it is important to observe correctly. It could be useful to study a seasonal effect.

Benchmarking: the most important is to have a historic of own farm. Then to compare own results with other farmers results is also important, but less. It is important to be careful and to compare comparable farms (depending on the size of the house, on the stocking densities, …).

App access: easy to download and to create the account. A bit long to fill out the questionnaire. Easy to use the app and to fill out the different screens but it seems important to be trained once, especially regarding behavioural observations to be sure to do it correctly. Some buttons are not easy to activate (natural light) and the help buttons are not always visible enough. It should be possible to go back to the previous screen.

Results: radar chart is very informative and simple.

Most difficult part: observe the behaviour of the animals for 5 minutes, it may require a training session (especially to have a precise definition of the different behaviours). Not precise enough on how to observe and sample animals on the range.

Easier part: all the rest, almost all the indoor observations.

What they would like to modify?: missing breed, some wordings, reduce the duration of the behavioural observations, slider to select the age is not adapted, scoring for the drinkers seems to be quite severe.

➔ Laying hens farmers (x1, Belgium)

Name of the farm and buildings

The question about the “name of the farm” was confusing, because it was not clear to the farmer whether this should be some kind of official name that other people/researchers would see/have to recognise or just something for himself.

Feeding systems: The farmer had a type of feeding system that is not in the app. It is called Bridomat™ (https://www.roxell.com/bridomat-trough-feeding-system), which is a feeding system with auger that spreads the feed automatically through the barn.

Breed: The farmer mentioned that he had Lohman Brown Lite chickens. In the app, only Lohman Brown was an option.

Behavioural observations: The farmer had trouble finding zones with at least 10 animals (the minimum number required by the app) in some parts of the building, because the density of birds was higher near the entrance and lower in the back and because many animals were outside. He chose to evaluate multiple zones in the busier areas.

Quantification of health issues: The assessment took 1 hour and 15 minutes, but the farmer only did 6 individual sanitary observations and then quickly filled out the same information for the other 39 birds. He thought the scan took way too much time and suggested that the number of observations should depend on the size of the buildings and the number of birds. For his building (520m^2) he thought evaluating 2 zones instead of 6 would require the time that he was willing to spend on it. For the individual observations, he would find 10 hens a more acceptable number than 45.

Global opinion: For the most part, the farmer found the app easy to use, but when asked if he thought the app was useful, he said that he did not think it would be of any added value to him and like-minded farmers. He said they already observe their animals every day, are focussed on animal welfare and do not need an app to help with that. When asked if he could think of any changes or additions to the app that would make it useful to him, he could not think of any. He also mentioned that he thinks other farmers might be afraid that the data from the app will somehow end up in the hands of inspectors and that if they don't score well, they will get extra checks.

Laying hens farmers (x1, France)

The App is considered useful to improve practices and welfare.

Quantification of health issues: important to count the number of problems in the farm.

Behavioural observations: important to count the behaviours to objectify how the birds behave.

Historic: very useful to remember when farmer have good or bad scores (seasonal effect, …).

Benchmarking: it is important to be careful and that would be better to compare to other farms assessed by a same assessor (because different farmers may score a same farm differently if they are not well trained).

App access: easy to download and to create the account. Farmer is not used to smartphone apps but found it very easy to use. The protocol is well detailed and the different steps are well described.

Results: radar chart is easy to understand.

Most difficult part: important to observe behaviours on the same area if we want to compare different assessments => not easy to remember where to observe if only 1 or 2 assessments are performed per flock.

Easier part: the health issues observation.

What they would like to modify?: some wordings, ask to record the number of trees on the range

➔These requests and remarks were discussed among task 3.1 partners and the EBENE® app subcontractor (cost, feasibility, …). The following modifications were implemented in the EBENE® app:

- Broilers:
    - Ergonomic aspects to facilitate the filling out of the questionnaire and to make some buttons easier to activate

  - Possibility to move back added (from one screen to the previous one)
  - Added details on the guidelines to help farmers to precisely know how to observe on the range
  - Free-range breeds added
  - Rewording of some sentences / questions that were confusing
  - Drinkers availability score was corrected (a mistake was found in the app)

Some long-term improvements may be implemented later on, regarding benchmarking for instance to compare the results of similar farms (comparison only with same houses sizes, with same stocking densities, …).

- Laying hens:
  - Rewording of some sentences / questions that were confusing
  - Modification of the minimum number of hens to be observed per area

Some long-term improvements may be implemented later on, regarding the number of hens to observe for health and the duration of behavioural observation for broilers as further data must be collected and analysed prior to any modification.

Some requests won't be implemented:

- Add a specific feeding system => it won't have any impact on the scoring and it seems very difficult to add all the different feeders in the app for the farmer to select his equipment.
- Count the number of trees on the range => it seems very difficult for some range that are huge and well tree-filled to count precisely the number of trees.

➢ Pigs

Summary of the on-farm visits (including feedback and subsequent app modifications)

- **SOW assessment tool**

  - **Farmer's suggestion:** add question **"Which breed of pigs do you have?"**
    - Farmer pointed out that different breeds have different maternal behaviour (e.g. Duroc sows have more tendency to crush piglets → higher piglet mortality)?
    - **Modification**: add "**Which breed(s) of pigs do you have**" with a **"free" text field**

  - **Farmer's suggestion**: add question **"Which type of farm do you have?"**
    - to differentiate: Organic Y/N, Porc Plein Air Y/N
    - **Modification**: as there is already a question in the app on type of farm (outdoor connected to stable or mobile huts), an additional question "organic farm Y/N?" is added

  - **Farmer's suggestion:** add an extra response option to the question **"Which type of heating is provided in the piglet's nest**?"
    - **Modification:** the suggested option (**radiant heater**) was included

  - **Farmer's suggestion:** clarify the question **"Est-ce que la truie halète?**"
    - **Modification**: "Est-ce que la truie halète/a une respiration rapide? (température élevée)"

  - **Farmer's suggestion:** clarify the question **"Comptez (en utilisant le bouton +) le nombre de porcelets qui présentent: splay leg"** (French speaking farmer)
    - **Modification**: adapt the question as "**splay leg (nageur)**"

  - **Farmer's suggestion:** add the question **"when did the sow give birth?"** for the individual observations of the farrowing sows
    - **Modification**: as it will take quite some time and effort to look this info up for each individual sow, the team decided to <u>not</u> include this additional question (in order to keep within the agreed time-span)

  - **Farmer's suggestion: fear of humans test**
    - Although the farmer mentioned that the test is feasible, he questioned the relevance as welfare indicator as he believes there are some temperamental sows that will never allow him to touch them (in contrast to most of his sows that allow it)
    - **Modification**: In order to keep – as agreed earlier – also positive behaviour indicators in the app, the team decided to keep this test bur rephrase it as "Score the **confidence in humans** for this sow"

- **FATTENING PIG assessment tool:**

  - **Farmer's suggestion:** clarify **"Quel est le nombre total de porcs d'élevage à la ferme?"** (French speaking farmer)
    - **Modification**: the question is rephrased as**:**
      - **Grower tool:** "Quel est le nombre total de porcs en post-sevrage à la ferme?"
      - **Finisher tool:** "Quel est le nombre total de porcs à l'engraissement à la ferme?"

  - **Farmer's suggestion:** clarify "**Quel est le taux de mortalité (%) sevrage vente (sur base annuelle)?"** (French speaking farmer)
    - **Modification**: the question is rephrased as**:**
    - **Grower tool:** "Quel est le taux de pertes en post-sevrage? (sur base annuelle)"
    - **Finisher tool:** "Quel est le taux de pertes en engraissement? (sur base annuelle)"

  - **Farmer's suggestion:** the question **"A quelle date les animaux sont-ils entrés dans la salle?"** does not make sense on small scale farms as it is not an all in all out system (so this date of entry will differ between different pens in one unit)
    - **Modification**: both questions "*Which is the date the grower pigs entered the housing unit?* " and "*At what age did the grower pigs enter the housing unit? (in days)*" are removed from the app and replaced by the questions:
      - "Have the pigs been in the current group for at least 14 days?" Y/N
      - "What is the average age (in days) of the pigs which you plan to assess?"

  - **Farmer's suggestion:** add an extra response option for question **"Do you observe grower pigs with signs of sunburn at any point in time during the year?"**
    - The farmer intuitively wanted to respond "NO" as he does not see it often (but sometimes)
    - **Modification**: add response option "occasionally" next to "yes" and "no"

H. Summary of the experimental and on-farm trials

WP	Species	Objective	Experimental trials	On-farm trials	When?
3.2	Broilers Pigs	Test how effective animal welfare self-assessment by the farmer combined with personalized feedback is in improving the welfare of animals in commercial organic and low input production systems	/	In farms in Belgium, France, The Netherlands	On-farm trials begin in September, 2020

WP	Species	Objective	Experimental trials	On-farm trials	When?
4.1	Laying hens	To develop incubation, hatching and early-life strategies in laying hens that result in a high use of the outdoor area and minimise feather pecking, feather damage and mortality	The NL (Bas Rodenburg) Groups of 10 hens (2 rounds of 200 hens; 400 hens in total) Treatments: light during incubation, enrichment after hatching with periodic access to insect larvae	In 5 rearing farms in The Netherlands or Belgium	On-farm visits not before end of 2020 (probably next year 2021 and 2022)
4.2	Laying hens	To develop an optimised design for the outdoor area for laying hens, that maximises use of the outdoor area and minimises feather pecking, feather damage and mortality	Belgium (Frank Tuyttens) Groups of 50 hens in mobile house with free range (2 rounds of 200 hens; 400 hens in total – same hens as in previous experiment) Treatments: effect of the design of the outdoor area, with and without insect feeding	In 5 farms in The Netherlands or Belgium	On-farm visits not before end of 2020 (probably next year 2021 and 2022)
4.3	Pigs	To develop strategies to prevent undesired behaviours in intact male pigs (mounting, aggression) and to avoid boar-taint in the end-products	France (Armelle Prunier + Lauriane Canario) 24 pigs/genotype Treatments: compare two genotypes of pigs and evaluate, within optimized rearing conditions, the influence of genotype of entire males on animal behaviour and on carcass and pork quality indicators	In farms in France	On-farm visits not before end of 2020 (probably next year 2021 and 2022)

WP	Species	Objective	Experimental trials	On-farm trials	When?
5.1	Poultry	To compare different dual-purpose genotypes in different environments	Denmark (Sanna Steenfeld) & Germany (Lisa Baldinger) Up to 252 birds/sex/ genotype & up to 160 males and 80 females/genotype Treatments: three dual-purpose crosses and one control with both males and females will be compared France: up to 750 birds/genotype Treatments: broilers of 4 different genotypes will be compared	/	Already on-going for pullets in experimental trials
5.2	Poultry	To test the most promising genotype (task 5.1) on commercial farms	/	In farms in Germany, Denmark and France	

WP	Species	Objective	Experimental trials	On-farm trials	When?
6.1	Broilers	To evaluate whether the genetic variability of exploratory behavior can be exploited and what is the interaction with free-range enrichment	Italy (Cesare Castellini) 150 birds/genotypes/enrichments Treatments: 4 genotypes and 3 enrichments will be tested for their ability to explore outdoor in interaction with enrichment and season France (Elisabeth Duval) 400 animals Treatments: exploratory behaviour France (Elisabeth Duval) 750 pedigree animals of one single strain will be followed by RFID technology Treatment: exploratory behaviour	In farms in Italy and France	On-farm visits after the end of experimental trials
6.2	Broilers	To explore how to stimulate the adaptive capacities of organic broiler chickens by adjusting early life management	The Netherlands (Bas Rodenburg) & Belgium (Frank Tuyttens) 150-200 chickens per treatment Treatments: after hatching in different conditions (thermal manipulations) in the Netherlands, chicks will be transported to the rearing facilities with outdoor access in Belgium	Another early-life lever for improving the adaptive capacities of slow-growing broilers will be studied on-farm in France	On-farm visits after the end of experimental trials

6.3	Piglets Laying hens	To develop strategies to limit intestinal parasitic and bacterial infection through different feed supplements to improve health and welfare of hens and piglets in organic outdoor systems.	Denmark (Ricarda Engberg) 56 hens (56x4 in total) Treatments: 3 infection trials each comprising 4 treatments will be conducted with organic laying hens Romania (Vasile Cozma) In vitro studies using intestinal material from 10 sows, 10 unweaned and 10 weaned piglets from one location Treatments: various strategies to limit parasite and bacterial infections and to improve health and welfare	In farms in Denmark for laying hens On-farm studies with pigs in Romania on 4 farms (20 sows/treatment; 40 piglets/treatment. 8 experiments with 2 treatments per experiment)	On-farm visits after the end of experimental trials (in vitro and in-vivo)
6.4	Sows Piglets	To develop genetic and outdoor rearing facilities to enhance piglet survival in loose housing and outdoor systems for organic pig production. Developments will be strengthened by integration of positive sow behaviour towards progeny and human in the choice of future breeders.	France (INRAE) 48 sows and litter / generation Treatments: sows from G1 and G2 and their progeny will be evaluated	All studies with outdoor farrowing housing facillities will be carried out on-farm (private organic pig herd) in Denmark => video and sensor data from approximately 120 litters born in outdoor huts of which existing videos of approximately 80 litters (representing two hut facilities and two genetic sow lines) will be re-used.	On-farm visits expected to start in late 2020

I. Poultry welfare assessment protocols for trained users

Welfare assessment protocol for broilers

Here are some guidelines for broilers welfare assessment in experimental conditions. Feel free to adapt them according to your experimental design (i.e. add more specific observation of some behaviours, a QBA, a tonic immobility test, …) and group size, as recommended below.

A. Health related observations

1. If birds are individually weighted

Observe these indicators *during birds weighing* as far as possible.

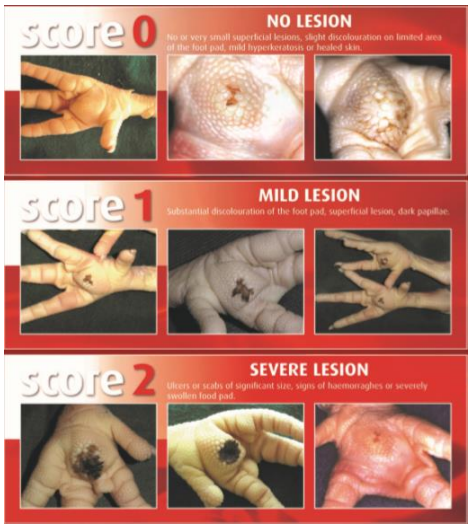
Birds weighting should be performed ideally at the beginning, mid and end of the broiler production phase (and before each depopulation if relevant).

Advice for sampling:

- Up to 50 birds per treatment: score all of them
- 50-100 birds per treatment: score at least 50 birds
- > 100 birds per treatment: score at least 50 birds, the more the better ☺
- How many pens to observe per treatment?
  In order to maximize the statistical treatment, we recommend you to record at least 6 pens per treatment, all when possible. In any case, try to define the minimal sampling to be statistically relevant (here an example of a French website that can help you: https://biostatgv.sentiweb.fr/?module=etudes/sujets).

Indicators to record:

- injury/wound (head, neck, wings, back/tail and belly):
  - lesion of at least 1 cm -> If possible distinguish fresh ones and old ones. Specify the injury/wound location.
- dirty birds:
  - Birds with conspicuous dark spots on the back, wings, tail feathers or cloaca.
- other abnormality – precise what is the abnormality you observe:
  - featherless bird
  - respiratory issue
  - … *(please detail the issue)*
- footpad lesions – observe both feet of each bird and record for each bird the worst score between both feet (see Swedish scoring system below):
  - 0 = no or light, very superficial lesions, slight discolouration on limited area of the foot pad, mild hyperkeratosis or healed skin
  - 1 = moderate substantial discolouration of the foot pas, superficial lesion, dark papillae
  - 2 = severe dermatitis ulcers or scabs of significant size, signs of haemorrhages or severely swollen foot pad (bumble foot included here)
    - If presence of bumble foot, please record it separately.



- Lameness:
  - Birds is reluctant to move and is unable to walk many strides before sitting down. To observe on a sample of birds only (approximately 10%) => after weighing the animal, release it and observe its walk
  - A bird that walk with ease, has regular and even strides and is well balanced OR with irregular and uneven strides and appears unbalanced is not considered as a lame bird. Please have a look at this video is you are not familiar at all with the observation of lameness: http://www.assurewel.org/broilers/walkingability.html (lameness = scores 2, 3, 4 and 5)

Remark regarding scales to be used: *we would propose you to use visual analogue scales (VAS below) that are continuous scales (see Fig. 1 below). For instance, if you want to score footpad lesion, you do not record an exact score (0, 1 or 2) but you put a slider on a predefined line with some points of reference. If you prefer, that is also possible to use ordinal scales "as usual" (NRS below).*

Footpad lesions scoring examples:

- *NRS scale = ordinal categories*

□ *score 0*

□ *score 1*

□ *score 2*

- *Tagged VAS scale = continuous scale => you are free to put a mark wherever you want on the continuous line from 0 to 2 on Figure 1 below*

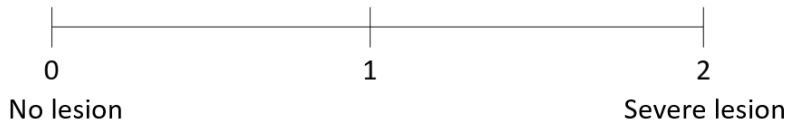


Figure 1: Visual analogue scale (VAS)

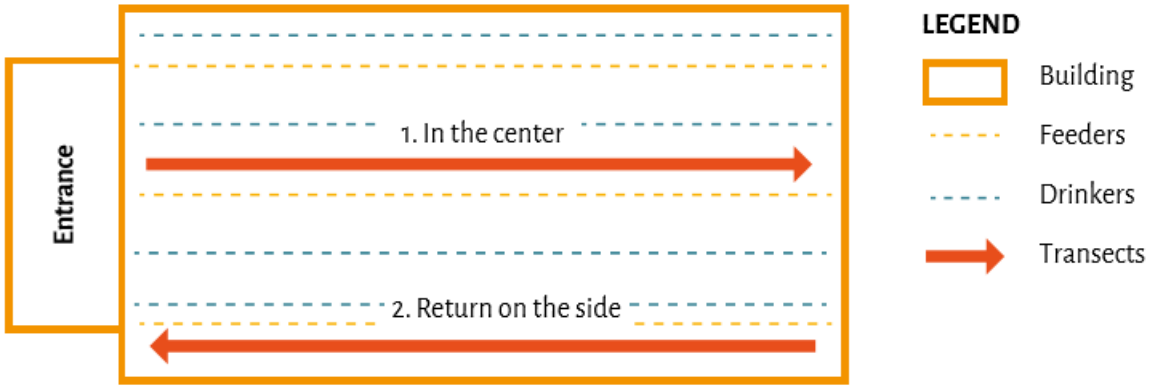
2. If birds are not individually weighted

If birds are not individually weighted, it may seem difficult to handle them to record health issues specifically. We suggest you to follow the transect walk methodology. This method does not allow precise observations as you do not handle birds.

Feel free to use the EBENE app or to record data on paper.

Transect walk description:

The observer must follow a route in the building by respecting a maximum width of 2 to 3 meters (between the walls, nipples, feeders). His walk must be calm and at constant rhythm. Please note the width of the route and note each time a bird is presenting one (or more) of the indicators you are interested in. Do not hesitate to gently push the birds to clearly observe their health status.



Indicators to record:

Note the presence/absence of the following indicators observed on the birds during your route:

- injury/wound (head, neck, wings, back/tail and belly):
  - lesion of at least 1 cm -> If possible distinguish fresh ones and old ones.
- dirty birds:
  - Birds with conspicuous dark spots on the back, wings, tail feathers or cloaca.
- Lame bird:
  - Birds that do not walk more than 2 to 3 steps
- other abnormality:
  - featherless bird
  - respiratory issue
  - … *(please detail the issue)*
- Small birds (around half less than the average bird size). If balances are present inside the building, note the birds' weight recorded via balances (if easier).

Handle 15 birds (EBENE app) or more (if possible) to record the foot-pad dermatitis. If you use the EBENE app, only record the presence / absence of foot-pad lesions. If you record data on paper, please use the same grid as described previously:

- 0 = no or light, very superficial lesions, slight discolouration on limited area of the foot pad, mild hyperkeratosis or healed skin
- 1 = moderate substantial discolouration of the foot pas, superficial lesion, dark papillae
- 2 = severe dermatitis ulcers or scabs of significant size, signs of haemorrhages or severely swollen foot pad (bumble foot included here)

When you release the birds, also observe the gait score (not possible to record on the EBENE app):

Assess the birds' walking ability using a gait score:

- 0 = Birds walk with ease, has regular and even strides and is well balanced
- 1 = Birds walk with irregular and uneven strides and appears unbalanced
- 2 = Birds is reluctant to move and is unable to walk many strides before sitting down

B. Behavioural observations

⇨ Observations to be performed at the mid and end of the production phase (and before each depopulation if relevant), **3 times a day** - beginning / middle & end of the lighting phase as far as possible

⇨ Be careful: as far as possible, take care to perform the behavioural observations out of specific events (*i.e.* turn on the light in the morning, feeding, …) that could potentially bias your recordings.

⇨ Birds will be observed in different areas (inside and outside):
  - 1 area = around 20 birds - depending on the size of the pen/house and the level of activity of the birds, you may want to observe less birds to facilitate the observation

Advice for sampling:

- How many areas per pen?
  - For pens with <u>at least 100 birds</u>:
    - 2 different areas will be observed in each pen
    - \+ 2 different areas on the range (if range is available and if enough birds are outside) ➔ choose one observation zone close to the traps and another including a different vegetation cover, please specify which type of cover it is. Do not perform these observations if it is rainy or windy.
  - For pens with <u>less than 100 birds</u>:
    - 1 area will be observed in each pen
    - \+ 2 different areas on the range (if range is available and if enough birds are outside) ➔ choose one observation zone close to the traps and another including a different vegetation cover, please specify which type of cover it is. Do not perform these observations if it is rainy or windy.
- How many pens to observe per treatment?
  In order to maximize the statistical treatment, we can recommend you to record at least 6 pens per treatment, all when possible. In any case, try to define the minimal sampling to be statistically relevant (here an example of a French website that can help you: <u>https://biostatgv.sentiweb.fr/?module=etudes/sujets)</u>

1. How to observe INSIDE?

For each area observed inside, proceed as follow:

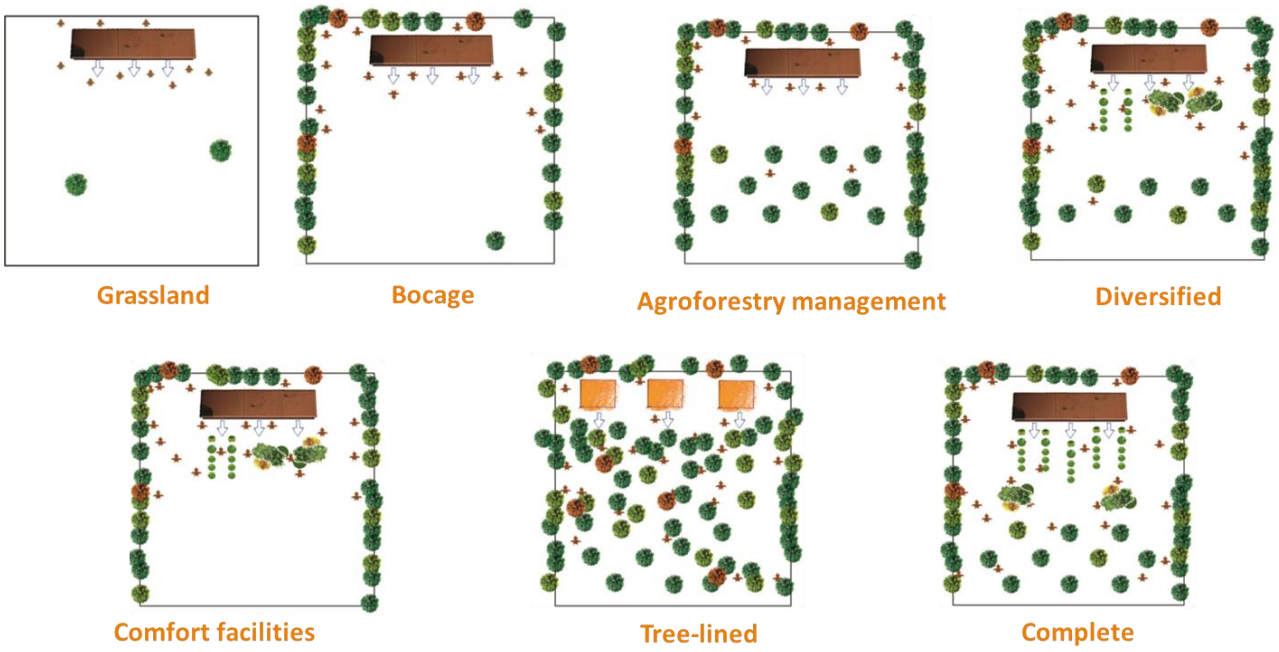
- Walk towards the first area and stand about 1m away (or even more if possible to do not disturb the birds) and wait for the birds to come back to normal.
- Record the number of animals on the area (approximately)
    - N = …
- Observe and record during 5 minutes, at least, each time an individual expresses at least one of the following behaviours:
    - Stretching/wing-leg flapping: An animal that deploys and folds one or both of its wings calmly and locally (without locomotor activity) or extends one of its legs
    - Aggressive behaviours: Pecks against one or more congeners, directed in particular towards the head
    - Interaction: Animals that groom each other, that peck each other in a non-aggressive way
    - Foraging: Pecks the litter or any other part of the building (except food and congeners) and / or scratching the litter with the claws
    - Dustbathing: Lying on the ground, the animal coats its feathers by dusts, stirring the litter with its wings and claws
    - Preening behaviours: Animal cleans his own feathers with his beak
    - (Use of the enrichment if available)
- Record the number of animals on the area (approximately)
    - N = …
- Observe the following behavioural indicators by scanning the area and estimate the percentage of animals that, at a specific moment (no duration), performs the behaviours listed below:
    - Panting: animal that breathes quickly with open mouth
    - At rest: animal lying on the ground without any activity

2. How to observe OUTSIDE?

Perform the observations on the range when the weather is favourable (*i.e.* no rain, no wind), otherwise you could bias the results.

For each area observed outside, proceed as follow:

- Walk towards the first area and stand about 1m away (or even more if possible to do not disturb the birds) and wait for the birds to come back to normal.
- Record:
    - Birds distribution
        - less than 25m from the pop holes
        - well distributed on the range
    - Estimate the % or number of birds outside
    - Range design : select the most appropriate design below:



- Record the number of animals on the area (approximately)
  - N = …
- Observe and record during 5 minutes each time an individual expresses at least one of the following behaviours:
  - Stretching/wing-leg flapping: An animal that deploys and folds one or both of its wings calmly and locally (without locomotor activity) or extends one of its legs
  - Aggressive behaviours: Pecks against one or more congeners, directed in particular towards the head
  - Interaction: Animals that groom each other, that peck each other in a non-aggressive way
  - Foraging: Pecks the litter or any other part of the building (except food and congeners) and / or scratching the litter with the claws
  - Dustbathing: Lying on the ground, the animal coats its feathers by dusts, stirring the litter with its wings and claws
  - Preening behaviours: Animal cleans his own feathers with his beak
  - (Use of the enrichment if available)
- Record the number of animals on the area (approximately)
  - N = …

Remark: it is possible to use the EBENE app. The same indicators will be recorded but it is only adapted to large houses since it is compulsory when using the app to observe 3 zones inside during 5mns + 4 zones outside.

C. Other indicators to record

- Litter quality
  - 0 (Dry and friable)
  - 1 (Friable but slightly moist)
  - 2 (Friable but crusty in some places)
  - 3 (Crust on the surface + friable by digging or totally crusty or wet)

- Mortality rate:

Dead birds can be scored daily by doing a walk inside and outside (on the range). At the end of the experiment, record the percentage of cumulative mortality and detail the reasons if possible.

Welfare assessment protocol for laying hens

Here are some guidelines for laying hens welfare assessment in experimental conditions. Feel free to adapt them according to your experimental design (i.e. add more specific observation of some behaviours, a QBA, a tonic immobility test, …) and group size, as recommended below.

A. Health related observations

1. If birds are individually weighted

Observe these indicators *during birds weighing* as far as possible.

-Pullets: birds weighting should be performed ideally at the beginning, mid and end of the pullet production phase.

-Layers: birds weighting should be performed ideally at the beginning of the laying period, peak production, after the peak production, end of the production cycle.

Advice for sampling:
- Up to 50 birds per treatment: score all of them
- 50-100 birds per treatment: score at least 50 birds
- > 100 birds per treatment: score at least 50 birds, the more the better ☺
- How many pens to observe per treatment?
  In order to maximize the statistical treatment, we recommend you to record at least 6 pens per treatment, all when possible. In any case, try to define the minimal sampling to be statistically relevant (here an example of a French website that can help you: https://biostatgv.sentiweb.fr/?module=etudes/sujets).

Indicators to record:
- plumage condition (neck, breast, back, wings and tail):
  - 0 = very good quality (perfect plumage);
  - 1 = a few missing feathers (minor deviation);
  - 2 = at least 5 cm of naked skin (major deviation)
- main featherless area (back, tail, cloaca, neck, head, wings)
- injury/wound (head, neck, wings, back/tail and belly):
  - lesion of at least 1 cm -> If possible distinguish fresh ones and old ones. Specify the injury/wound location.
- keel bone damage:
  - record any deformation or deviation from its normal shape
- beak trimming quality:
  - 0 = normal beak trimming
  - 1 = with minor abnormalities
  - 2 = with major abnormalities

- footpad lesions – observe both feet of each bird and record for each bird the worst score between both feet (see Swedish scoring system below):
  - 0 = no or light, very superficial lesions, slight discolouration on limited area of the foot pad, mild hyperkeratosis or healed skin
  - 1 = moderate substantial discolouration of the foot pas, superficial lesion, dark papillae
  - 2 = severe dermatitis ulcers or scabs of significant size, signs of haemorrhages or severely swollen foot pad (bumble foot included here)
    - ➢ If presence of bumble foot, please record it separately.

- other abnormality – precise what is the abnormality you observe:
  - discoloured crest
  - respiratory issue
  - … *(please detail the issue)*

Remark regarding scales to be used: *we would propose you to use visual analogue scales (VAS below) that are continuous scales (see Fig. 1 below). For instance, if you want to score footpad lesion, you do not record an exact score (0, 1 or 2) but you put a slider on a predefined line with some points of reference. If you prefer, that is also possible to use ordinal scales "as usual" (NRS below).*

Footpad lesions scoring examples:

- *NRS scale = ordinal categories*

□ *score 0;* □ *score 1;* □ *score 2*

- *Tagged VAS scale = continuous scale => you are free to put a mark wherever you want on the continuous line from 0 to 2 on Figure 1 below*

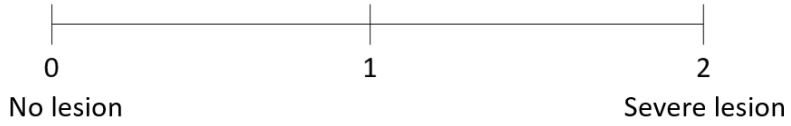


Figure 1: Visual analogue scale (VAS)

2. If birds are not individually weighted

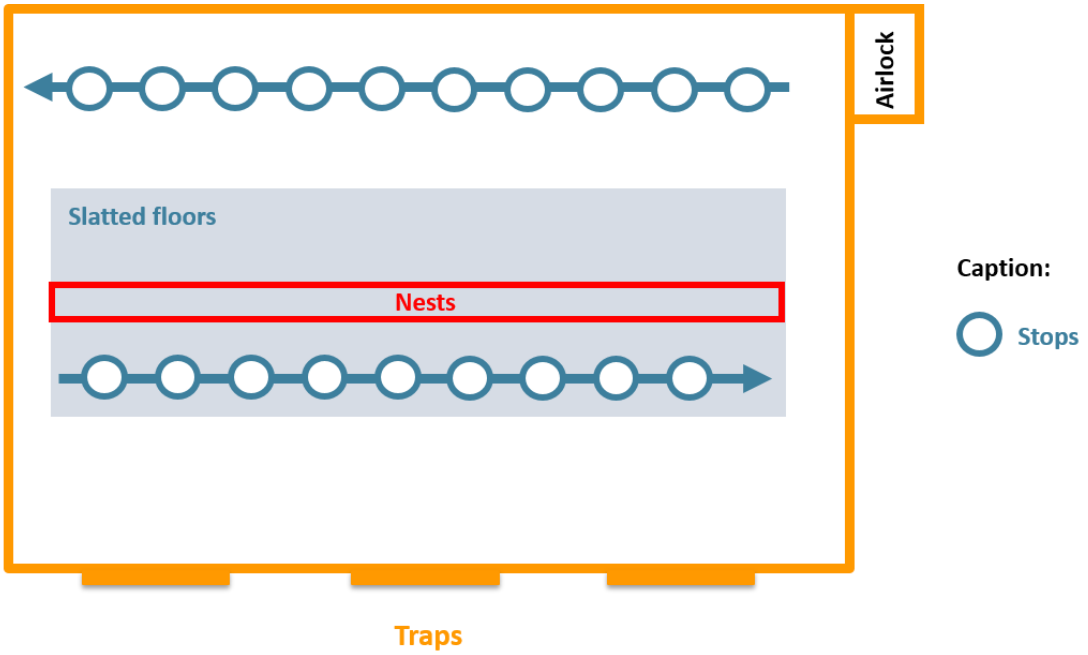
If birds are not individually weighted, it may seem difficult to handle them to record health issues specifically. We suggest you to follow the sampling methodology proposed in the EBENE app. This method does not allow precise observations as you do not handle birds.

Feel free to use the EBENE app or to record data on paper.

Method description:

Do 2 passages as recommend below:

1. Keep a calm pace;
2. Plan to do 8 stops during the first passage and 7 stops during the second passage, equally distributed along the barn length;
3. Each stop, randomly identify 3 hens and observe the indicators described below. If one hen is concerned by several indicators, all of them must be considered by the assessor.



Indicators to record:

Note the presence/absence of the following indicators observed on the birds during your route:

- plumage condition (neck, breast, back, wings and tail):
  - 0 = very good quality (perfect plumage);
  - 1 = a few missing feathers (minor deviation);
  - 2 = at least 5 cm of naked skin (major deviation)
- main featherless area (back, tail, cloaca, neck, head, wings)
- injury/wound (head, neck, wings, back/tail and belly):
  - lesion of at least 1 cm -> If possible distinguish fresh ones and old ones. Specify the injury/wound location.
- beak trimming quality:
  - 0 = normal beak trimming
  - 1 = with minor abnormalities

  - 2 = with major abnormalities
- other abnormality – precise what is the abnormality you observe:
  - discoloured crest
  - respiratory issue
  - … *(please detail the issue)*
- Small birds (around half less than the average bird size). If balances are present inside the building, note the birds' weight recorded via balances (if easier).

Handle 12 birds (EBENE app) or more (if possible) to record the keel bone damage (any deformation or deviation from its normal shape).

You may also record the foot-pad dermatitis issues on these handled birds on paper (not possible to record this issue directly on the app for layers). Please use the same grid as described previously:

- 0 = no or light, very superficial lesions, slight discolouration on limited area of the foot pad, mild hyperkeratosis or healed skin
- 1 = moderate substantial discolouration of the foot pas, superficial lesion, dark papillae
- 2 = severe dermatitis ulcers or scabs of significant size, signs of haemorrhages or severely swollen foot pad (bumble foot included here)

B. Behavioural observations

⇨ Pullets: observations to be performed at the mid and end of the pullet production phase, **3 times a day** - beginning / middle & end of the lighting phase as far as possible
⇨ Layers: observations to be performed at the peak production, after the peak production and at the end of the production cycle, **3 times a day** - beginning / middle & end of the lighting phase as far as possible
⇨ Be careful: as far as possible, take care to perform the behavioural observations out of specific events (*i.e.* turn on the light in the morning, feeding, …) that could potentially bias your recordings.
⇨ Birds will be observed in different areas (inside and outside):
  - 1 area = around 20 birds - depending on the size of the pen/house and the level of activity of the birds, you may want to observe less birds to facilitate the observation

Advice for sampling:

- How many areas per pen?
  - For pens with <u>at least 100 birds:</u>
    - 2 different areas will be observed in each pen
    - + 2 different areas on the range (if range is available and if enough birds are outside) ➔ choose one observation zone close to the traps and another including a different vegetation cover, please specify which type of cover it is. Do not perform these observations if it is rainy or windy.
  - For pens with <u>less than 100 birds:</u>
    - 1 area will be observed in each pen
    - + 2 different areas on the range (if range is available and if enough birds are outside) ➔ choose one observation zone close to the traps and another including a different vegetation cover, please specify which type of cover it is. Do not perform these observations if it is rainy or windy.
- How many pens to observe per treatment?
  In order to maximize the statistical treatment, we can recommend you to record at least 6 pens per treatment, all when possible. In any case, try to define the minimal sampling to be statistically

relevant (here an example of a French website that can help you: https://biostatgv.sentiweb.fr/?module=etudes/sujets).

1. How to observe INSIDE?

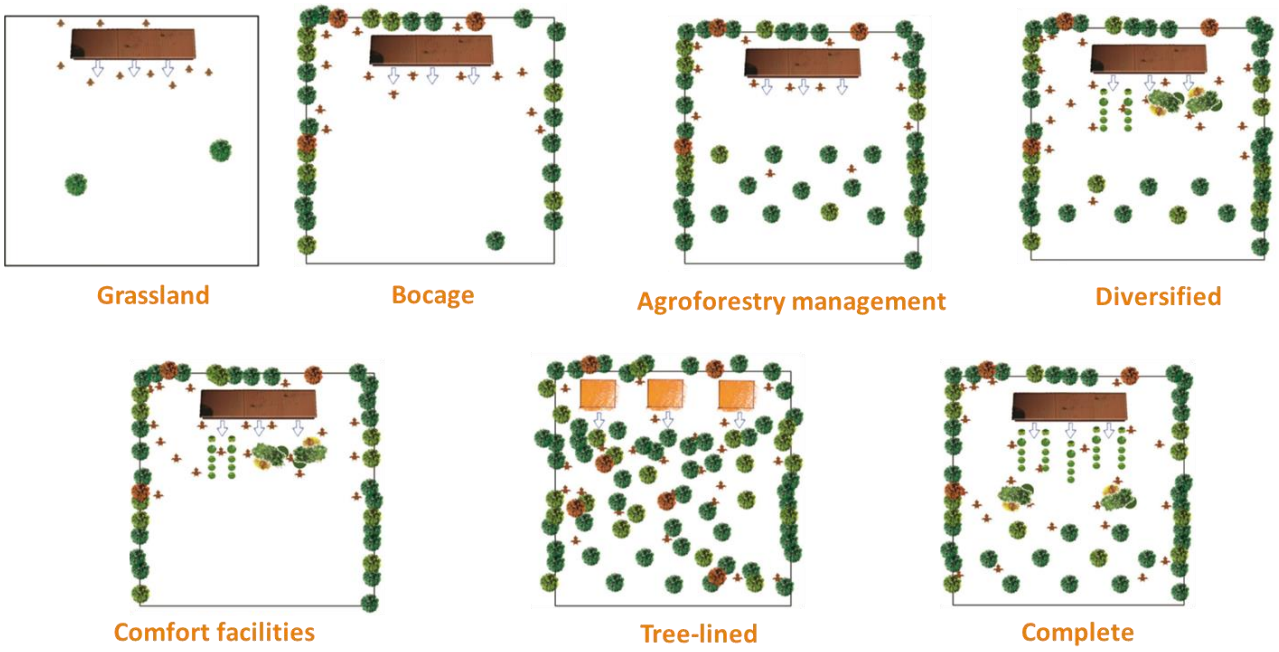
For each area observed inside, proceed as follow:

- Walk towards the first area and stand about 1m away (or even more if possible to do not disturb the birds) and wait for the birds to come back to normal.
- Record the number of animals on the area (approximately)
  - N = …
- Observe and record during 5 minutes, at least, each time an individual expresses at least one of the following behaviours:
  - Stretching/wing-leg flapping: An animal that deploys and folds one or both of its wings calmly and locally (without locomotor activity) or extends one of its legs
  - Aggressive behaviours: Pecks against one or more congeners, directed in particular towards the head
  - Interaction: Animals that groom each other, that peck each other in a non-aggressive way
  - Foraging: Pecks the litter or any other part of the building (except food and congeners) and / or scratching the litter with the claws
  - Dustbathing: Lying on the ground, the animal coats its feathers by dusts, stirring the litter with its wings and claws
  - Preening behaviours: Animal cleans his own feathers with his beak
  - (Use of the enrichment if available)
- Record the number of animals on the area (approximately)
  - N = …
- Observe the following behavioural indicators by scanning the area and estimate the percentage of animals that, at a specific moment (no duration), performs the behaviours listed below:
  - Panting: Animal that breathes quickly with open mouth
  - Moving

2. How to observe OUTSIDE?

Perform the observations on the range when the weather is favourable (*i.e.* no rain, no wind), otherwise you could bias the results.

- Walk towards the first area and stand about 1m away (or even more if possible to do not disturb the birds) and wait for the birds to come back to normal.
- Record:
  - Birds distribution
    - less than 25m from the pop holes
    - well distributed on the range
  - Estimate the % or number of birds outside
  - Range design : select the most appropriate design below:



- Record the number of animals on the area (approximately)
  - N = …
- Observe and record during 5 minutes each time an individual expresses at least one of the following behaviours:
  - Stretching/wing-leg flapping: An animal that deploys and folds one or both of its wings calmly and locally (without locomotor activity) or extends one of its legs
  - Aggressive behaviours: Pecks against one or more congeners, directed in particular towards the head
  - Interaction: Animals that groom each other, that peck each other in a non-aggressive way
  - Foraging: Pecks the litter or any other part of the building (except food and congeners) and / or scratching the litter with the claws
  - Dustbathing: Lying on the ground, the animal coats its feathers by dusts, stirring the litter with its wings and claws
  - Preening behaviours: Animal cleans his own feathers with his beak
  - (Use of the enrichment if available)
- Record the number of animals on the area (approximately)
  - N = …

Remark: it is possible to use the EBENE app. The same indicators will be recorded but it is only adapted to large houses since it is compulsory when using the app to observe 3 zones inside during 2mns + 4 zones outside.

C. Other indicators to record

- Litter quality
  - 0 (Dry and friable)
  - 1 (Friable but slightly moist)
  - 2 (Friable but crusty in some places)
  - 3 (Crust on the surface + friable by digging or totally crusty or wet)

- Mortality rate:

Dead birds can be scored daily by doing a walk inside and outside (on the range). At the end of the experiment, record the percentage of cumulative mortality and detail the reasons if possible.

J. Pig welfare assessment protocols for trained users

Welfare assessment guidelines for fattening pigs

These are guidelines for general welfare assessments of fattening pigs (pigs from weaning up to slaughter). You are free to adapt them by adding additional indicators that are relevant for your experiment or by applying changes to the assessment method to better fit your experimental protocol.

Recommendations for the number of animals to assess

For indicators measured on an individual level:

- If there are < 50 animals per treatment group, assess all animals
- If there are > 50 animals per treatment group, assess at least 50 animals, but preferably as many as possible

For indicators measured on a group level:

- Assess at least 6 groups, but assess all groups if possible

Recommendation for the scoring method

We recommend to score the indicators for which it is possible/relevant to rate the severity on a continuous scale. This can be done on a tagged visual analogue scale or by scoring on a large range of numbers (for example 0 to 100). By marking the visual analogue scale with the numbers 0 to 100, the two types of scales become effectively the same (see figure 1).

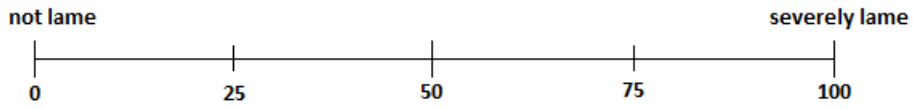


Figure 1: Visual analogue scale (VAS)

Welfare assessment

We recommend to perform the assessment at a time-point when all animals have been in the same group for at least 14 days to avoid an effect of social tension on the welfare indicators that are measured. However, if the early phase after forming new groups is especially relevant to your experiment, please do perform the welfare assessment within these 14 days.

We also advice to start the assessment at least one hour after feeding (unless the animals are fed ad libitum) to avoid any influence of feeding time.

Indicators to be measured on an individual level

- Cleanliness/covered with faeces
    - Score the percentage of the skin surface on one side of the body that is covered with faeces (score between 0 and 100)
    - Note that this parameter should not be confused with dirtiness: an outdoor pig soiled with mud (on a warm day) is normal, and does not necessarily indicate a welfare problem.
- Panting
    - Score on a continuous scale from 0 to 100
    - 0 = normal breathing

    - 33 = breaths are slightly more rapid and shallow
    - 67 = breaths are clearly rapid and shallow, and faster chest movements can be seen
    - 100 = breaths are very short and shallow, and the chest is moving rapidly
- Shivering
    - Yes | no
- Too small
    - The animal is 1/3 smaller than the average pig in the same group
    - Yes/no
- Bad general state
    - This indicator is meant to pick up on animals that show general signs of sickness or otherwise compromised health. Examples of such signs are animals which are obviously in pain, sick, needing further care to avoid complications, dull or apathic, isolated from the group, with dull/sunken eyes, blue/red ears or snout, pale skin colour, rapid respiration
    - Yes | no
- Hernia
    - Score on a continuous scale from 0 to 100
    - 0 = no hernia
    - 25 = small protrusion, no bleeding
    - 50 = small bleeding protrusion or medium size but not bleeding
    - 75 = medium size and bleeding protrusion or a large protrusion (bigger than the distance between hernia and floor) that is not bleeding
    - 100 = hernia is much bigger than the distance between the hernia and the floor and bleeding
- Lameness
    - Score on a continuous scale from 0 to 100
    - 0 = no lameness
    - 25 = stiffness of one the legs while walking
    - 50 = the animal can walk, but weight baring on one of the legs is significantly reduced
    - 75 = the animal has clear difficulty walking and puts almost no weight on the affected leg
    - 100 = lameness is so severe that the animal cannot stand upright
- Laboured breathing
    - Score on a continuous scale from 0 to 100
    - 0 = normal breathing
    - 25 = breathing is slightly more heavy than normal
    - 50 = breathing clearly sounds more heavy than normal
    - 75 = more laboured breathing and more pronounced movements of the chest
    - 100 = very heavy breathing (pumping) and laboured movements of the chest with each breath
- Scratches
    - Only thin, shallow marks are considered as scratches. Anything deeper or larger is considered to be a skin wound.
    - Count the number of scratches <u>on one side of the body</u>
- Skin wounds
    - Score the wounds on <u>one side of the body</u> on a continuous scale from 0 to 100
    - 0 = no skin wounds
    - 25 = several small (<2cm), shallow wounds that are healed
    - 50 = several small wounds that are open/bleeding, several medium size (2-5cm) wounds that are healed
    - 75 = several medium size wounds that are open/bleeding, several large (>5cm) wounds that are healed
    - 100 = several large, deep wounds that are bleeding
- Skin irritation

    - Score on a continuous scale from 0 to 100
    - 0 = normal skin
    - 25 = mild local skin inflammation or mild red spots (<10% of body surface)
    - 50 = larger area of mildly inflamed/spotted skin (>10%) or a small but clearly inflamed/spotted zone
    - 75 = a large area of the skin that is clearly inflamed/spotted
    - 100 = severely inflamed skin or dark spots over a large area of the skin or less severe inflammation/spots over a much larger area (>30%)
- Ear lesions
    - Score on a continuous scale from 0 to 100
    - 0 = no ear lesions
    - 25 = only small scabs or scratch-like lesions are visible
    - 50 = there are bigger crusts on the ears or small lesions with dried blood
    - 75 = there are big crusts on the ears and/or bleeding lesions
    - 100 = ears are severely damaged by lesions and there are fresh, bleeding lesions
- Tail lesions
    - Score on a continuous scale from 0 to 100
    - 0 = no tail lesions
    - 25 = only small, minor lesions without blood
    - 50 = slightly bigger lesions with some swelling or dried blood
    - 75 = open wounds, significant swelling or fresh blood
    - 100 = open wounds, significant swelling and fresh blood

Indicators to be measured on a group level

- Note how many animals are in the group that you observe
- Huddling
    - Assess the percentage of animals in the group that is huddling, divided into categories
    - <20% of pigs | 20%-50% of pigs | >50% of pigs
- Lying position
    - Assess the number or percentage of animals in the group that is lying in each of these three positions
    - Sternal position = Lying on the belly with all four legs tugged under the body
    - Half-sternal position = Lying on the belly with the hind legs folded under the body and the front legs extended towards the front
    - Lateral position = Lying on one flank with all four legs extended
    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead
- Liquid faeces in the pen
    - Assess the relative amount of faeces visible in the pen that are liquid, divided into categories
    - No liquid faeces | Some liquid faeces | More than half of all faeces | All visible faeces are liquid
- Enrichment use
    - Count the number of pigs in the group that are currently using enrichment
    - Examples of types of enrichment: straw - roughage | fixed wood | loose wood | burlap sack | chain | fixed toys (by chain or bar) | loose toys | soil | pasture (grass) | wallow
    - If you find it difficult to determine what counts as using enrichment, you could also choose to count the number of animals showing certain behaviours associated with an enriched environment, e.g. object play, exploratory behaviour or playing in mud/soil
- Confidence in humans

  - Before starting this test, you need to enter and walk around the pen to ensure that all animals have noticed you. Do not start the timer until you are standing still.
  - Record the time (in seconds) it requires before the first pig approaches and touches you (after entering the pen). If no pig touches you within 120 seconds, end the test and continue with the next question.
- Sneezing or coughing
  - At the end of each group assessment, note whether you heard/saw any coughing or sneezing in the group
  - Yes | No

Indicators to be measured on farm level

- Signs of sunburn
  - Note whether you observe any pigs with signs of sunburn at any point during the year Signs of sunburn are reddening, oedema and possibly scabs and peeling of the skin
  - Yes | No
- Range use
  - Note whether there are any parts of the outdoor area that are never/rarely used
  - Yes | No

Welfare assessment guidelines for sows

These are guidelines for general welfare assessments of sows. You are free to adapt them by adding additional indicators that are relevant for your experiment or by applying changes to the assessment method to better fit your experimental protocol.

Recommendations for the number of animals to assess

For indicators measured on an individual level:

- If there are < 50 animals per treatment group, assess all animals
- If there are > 50 animals per treatment group, assess at least 50 animals, but preferably as many as possible

For indicators measured on a group level (if the sows are group housed):

- Assess at least 6 groups, but assess all groups if possible

Recommendation for the scoring method

We recommend to score the indicators for which it is possible/relevant to rate the severity on a continuous scale. This can be done on a tagged visual analogue scale or by scoring on a large range of numbers (for example 0 to 100). By marking the visual analogue scale with the numbers 0 to 100, the two types of scales become effectively the same (see figure 1).

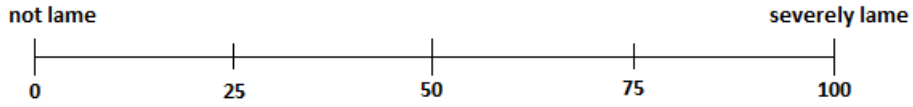


Figure 1: Visual analogue scale (VAS)

Welfare assessment

If the sows are group housed, we recommend to perform the assessment at a time-point when all animals have been in the same group for at least 14 days to avoid an effect of social tension on the welfare indicators that are measured. However, if the early phase after forming new groups is especially relevant to your experiment, please do perform the welfare assessment within these 14 days.

We also advice to start the assessment at least one hour after feeding (unless the animals are fed ad libitum) to avoid any influence of feeding time.

Indicators to be measured on an individual level

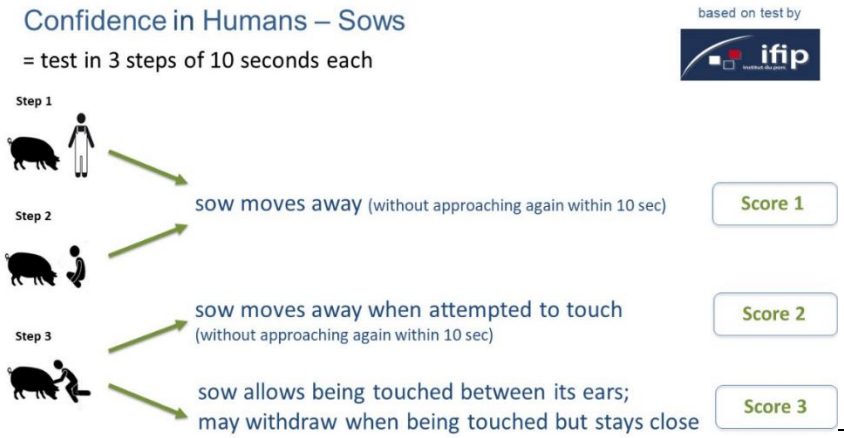
- Cleanliness/covered with faeces
    - Score the percentage of the skin surface on one side of the body that is covered with faeces (score between 0 and 100)
    - Note that this parameter should not be confused with dirtiness: an outdoor pig soiled with mud (on a warm day) is normal, and does not necessarily indicate a welfare problem.
- Panting
    - Score on a continuous scale from 0 to 100
    - 0 = normal breathing
    - 33 = breaths are slightly more rapid and shallow
    - 67 = breaths are clearly rapid and shallow, and faster chest movements can be seen
    - 100 = breaths are very short and shallow, and the chest is moving rapidly

- Shivering
    - Yes | no
- Body condition: for body condition we advise to measure “too fat” and “too lean” on separate scales of 0 to 100, as the two condition indicate opposite welfare problems. When scoring “too fat”, a score of 0 can mean both a perfectly normal condition or that the sow is too lean, and the opposite for scoring “too lean”.
    3. Too fat
        - View the sow from behind and palpate if possible
        - Score on a continuous scale from 0 to 100. 0 = normal body condition (with firm pressure, the hip bones and back bone can be felt) or too lean
        - 50 = no hip bones or vertebrae are visible, flanks are slightly rounded, small folds of fat are visible on the thighs and near the base of the tail
        - 100 = hip bones and back bone cannot be felt even with strong pressure and big folds of fat are visible around the thighs
    4. Too lean
        - View the sow from behind and palpate if possible
        - Score on a continuous scale from 0 to 100
        - 0 = normal body condition (the hip bones and back bone can be felt when applying firm pressure with the hand) or too fat
        - 50 = hip bones can easily be felt without applying pressure, flanks are slightly sunken, some individual vertebrae are visible
        - 100 = hip bones and back bone are clearly visible, flanks are clearly sunken and some ribs are visible
- Bad general state
    - Yes | no
    - This indicator is meant to pick up on animals that show general signs of sickness or otherwise compromised health. Examples of such signs are animals which are obviously in pain, sick, needing further care to avoid complications, dull or apathic, isolated from the group, with dull/sunken eyes, blue/red ears or snout, pale skin colour, rapid respiration
- Hernia
    - Score on a continuous scale from 0 to 100
    - 0 = no hernia
    - 25 = small protrusion, no bleeding
    - 50 = small bleeding protrusion or medium size but not bleeding
    - 75 = medium size and bleeding protrusion or a large protrusion (bigger than the distance between hernia and floor) that is not bleeding
    - 100 = hernia is much bigger than the distance between the hernia and the floor and bleeding
- Lameness
    - Score on a continuous scale from 0 to 100
    - 0 = no lameness
    - 25 = stiffness of one the legs while walking
    - 50 = the animal can walk, but weight baring on one of the legs is significantly reduced
    - 75 = the animal has clear difficulty walking and puts almost no weight on the affected leg
    - 100 = lameness is so severe that the animal cannot stand upright
- Laboured breathing
    - Score on a continuous scale from 0 to 100
    - 0 = normal breathing
    - 25 = breathing is slightly more heavy than normal
    - 50 = breathing clearly sounds more heavy than normal
    - 75 = more laboured breathing and more pronounced movements of the chest

  - 100 = very heavy breathing (pumping) and laboured movements of the chest with each breath
- Bursitis
  - A fluid filled swelling of the knee or hock region
  - Score on a continuous scale from 0 to 100: one combined score for the front and hind limb on one side
  - 0 = no swelling
  - 25 = a small bursa (<2cm)
  - 50 = multiple small bursa or a medium size bursa (3-5cm)
  - 75 = several medium size bursae or a large bursa (>5cm)
  - 100 = very large bursa (>8cm), bursa with a wound or several large bursae
- Shoulder lesions
  - Score on a continuous scale from 0 to 100 for the most severely affected shoulder
  - 0 = no shoulder lesions
  - 25 = a small, healed injury or reddening of the area without skin penetration
  - 50 = a large healed injury or a small but fresh lesion
  - 75 = a large lesion with dried blood or medium size lesion that is bleeding
  - 100 = a large, bleeding injury
- Prolapse
  - Protrusions of the rectum, bladder, vagina or uterus
  - Note whether the sow has a prolapse and of which organ
  - No | Rectum | Bladder | Vagina | Uterus
- Lesions on teats (only for farrowing sows)
  - Score on a continuous scale from 0 to 100
  - 0 = no lesions
  - 25 = a maximum of 3 nipples with lesions, no dried or fresh blood
  - 50 = fresh lesions on more than 3 nipples, no injured teats
  - 75 = healing lesions of several teats
  - 100 = several injured and bleeding teats
- Mastitis (only for farrowing sows)
  - Mastitis is inflammation of the udder which causes the udder to look red and swollen
  - Observe from a distance and note whether the sow has mastitis
  - Yes | No
  - If relevant to your experiment, you can palpate the udder to score in more detail and determine if it feels hard and hot
- Abnormal vaginal discharge
  - Note whether the sow has abnormal vaginal discharge
  - Yes | No
- Vulva lesions
  - Score on a continuous scale from 0 to 100
  - 0 = no lesions
  - 25 = a small (<2cm) scab or healing lesion
  - 50 = healing lesions of 2-5cm
  - 75 = fresh, bleeding lesion of <5cm or healing lesion of >5cm
  - 100 = a large (>5cm) bleeding lesion
- Scratches
  - Count the number of scratches on one side of the body
  - Only thin, shallow marks are considered as scratches. Anything deeper or larger is considered to be a skin wound
- Skin wounds
  - Score the wounds on one side of the body on a continuous scale from 0 to 100
  - 0 = no skin wounds

- 25 = several small (<2cm), shallow wounds that are healed
- 50 = several small wounds that are open/bleeding, several medium size (2-5cm) wounds that are healed
- 75 = several medium size wounds that are open/bleeding, several large (>5cm) wounds that are healed
- 100 = several large, deep wounds that are bleeding

- Skin irritation
  - Score on a continuous scale from 0 to 100
  - 0 = normal skin
  - 25 = mild local skin inflammation or mild red spots (<10% of body surface)
  - 50 = larger area of mildly inflamed/spotted skin (>10%) or a small but clearly inflamed/spotted zone
  - 75 = a large area of the skin that is clearly inflamed/spotted
  - 100 = severely inflamed skin or dark spots over a large area of the skin or less severe inflammation/spots over a much larger area (>30%)
- Ear lesions
  - Score on a continuous scale from 0 to 100
  - 0 = no ear lesions
  - 25 = only small scabs or scratch-like lesions are visible
  - 50 = there are bigger crusts on the ears or small lesions with dried blood
  - 75 = there are big crusts on the ears and/or bleeding lesions
  - 100 = ears are severely damaged by lesions and there are fresh, bleeding lesions
- Tail lesions
  - Score on a continuous scale from 0 to 100
  - 0 = no tail lesions
  - 25 = only small, minor lesions without blood
  - 50 = slightly bigger lesions with some swelling or dried blood
  - 75 = open wounds, significant swelling or fresh blood
  - 100 = open wounds, significant swelling and fresh blood
- Frothy saliva
  - Note whether the sow has frothy/foaming saliva
  - Yes | No
- Confidence in humans (only for pregnant sows)
  - Calmly enter the pen and walk around to ensure the sows observed your presence. The test consists of 3 steps (each of 10 seconds):
  - 1) walk towards the front side of the sow and stop at approximately 50 cm to 1 m
    2) squat in front of the sow
    3) try to touch the sow between its ears
    To know which score to assign, see the **image** below.
  - This can also be tested on group level if this fits better with the housing arrangements (see guidelines for fattening pigs)



Indicators

Some of these indicators can be assessed on an individual level if the animals are not housed in groups.

- Note how many animals are in the group that you observe
- Huddling
    - Assess the percentage of animals in the group that is huddling, divided into categories
    - <20% of pigs | 20% -50% of pigs | >50% of pigs
    - If the animals are not housed in groups, this indicator cannot be measured
- Lying position
    - Assess the number or percentage of animals in the group that is lying in each of these three positions
    - Sternal position = Lying on the belly with all four legs tugged under the body
    - Half-sternal position = Lying on the belly with the hind legs folded under the body and the front legs extended towards the front
    - Lateral position = Lying on one flank with all four legs extended
    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead
- Enrichment use
    - Count the number of sows using enrichment
    - Examples of types of enrichment: straw - roughage | fixed wood | loose wood | burlap sack | chain | fixed toys (by chain or bar) | loose toys | soil | pasture (grass) | wallow
    - If you find it difficult to determine what counts as using enrichment, you could also choose to count the number of animals showing certain behaviours associated with an enriched environment, e.g. object play, exploratory behaviour or playing in mud/soil
    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead as a yes/no question
- Liquid faeces in the pen
    - Assess the relative amount of faeces visible in the pen that are liquid, divided into categories
    - No liquid faeces | Some liquid faeces | More than half of all faeces | All visible faeces are liquid
    - If the animals are not housed in groups, the indicator can be assessed during each individual observation instead
- Sneezing or coughing
    - At the end of each group assessment, note whether you heard/saw any coughing or sneezing in the group
    - Yes | No
    - If the animals are not housed in groups, the indicator can be assessed at the end of each individual observation instead

Indicators to be measured on farm level

- Signs of sunburn
    - Note whether you observe any pigs with signs of sunburn at any point during the year Signs of sunburn are reddening, oedema and possibly scabs and peeling of the skin
    - Yes | No
- Range use
    - Note whether there are any parts of the outdoor area that are never/rarely used
    - Yes | No

Welfare assessment protocol for piglets

These are guidelines for general welfare assessments of piglets. You are free to adapt them by adding additional indicators that are relevant for your experiment or by applying changes to the assessment method to better fit your experimental protocol.

It is advised to combine the assessment of a litter of piglets with the individual assessment of the sow. Thus the number of observed litters of piglets will be the same as the number of individually observed sows.

Indicators to be measured on a group level

If you have a large number of litters to score, you can choose to simplify the scoring method. Instead of counting the number of piglets in the litter that is positive for a certain indicator, you can state whether at least one of the piglets in the litter is positive for the indicator Yes/No.

- Note the number of piglets in the litter
- Huddling
  - Assess the percentage of animals in the group that is huddling, divided into categories
  - <20% of piglets | 20%-50% of piglets | >50% of piglets
- Panting
  - Count the number of piglets that are panting
- Shivering
  - Count the number of piglets that are shivering
- Cleanliness/covered with faeces
  - Count the number of piglets that are covered with faeces over at least 20% of the skin surface on one side of the body
- Playful behaviour
  - Count the number of piglets that are showing playful behaviour
- Non-vital, weak, sick
  - Count the number of piglets that look non-vital, weak or sick
- Neurological disorders
  - Signs of neurological disorders include muscle tremors and/or paddling of the limbs
  - Count the number of piglets with signs of neurological disorders
- Splay legs
  - Partial paralysis of hind limbs, resulting in inability to stand and the hind limbs being spread (splayed) apart
  - Count the number of piglets with splay legs
- Skin lesions snout
  - Count the number of piglets with skin lesions on the snout
- Skin lesions front legs
  - Count the number of piglets with skin lesions on the front legs
- Laboured breathing
  - Count the number of piglets that display laboured breathing
- Sneezing/coughing
  - Note whether you heard any of the piglets cough or sneeze during the assessment
  - Yes | No

Advice for frequency and timing of assessment

This advice can be followed if you do not have your own ideas about a suitable number and timing of welfare assessments. If another frequency or moment in time is relevant for your experiments, or you do not have a lot of man power, feel free to adapt.

T4.3: fattening pigs, group housed
Advice: at least 2 assessments per year in different seasons

T6.3: 30 sows, housed in groups of 10 during pregnancy and individually after farrowing. Assessment of sows, their piglets and the weaned piglets/fattening pigs until 4-6 months of age.
Advice: one assessment of pregnant sows, one of the farrowing sows with their piglets and one of the pig(let)s after weaning for each batch

T6.4.1: 48 sows for G1 and for G2, each in 4 batches of 12. Sows are individually housed with their piglets.
Advice: one assessment of pregnant sows and one of the farrowing sows with their piglets for each batch

T6.4.2: 12 sows per round with piglets, 6-8 batches
Advice: one assessment during pregnancy and one after farrowing of the sow with her piglets for each batch.

Timing of the assessments
Fattening pigs: approximately 3 weeks after weaning
Pregnant sows: approximately 4 weeks after insemination
Sows with piglets: approximately 2 weeks after birth. If the piglets are weaned at a late age, it could be useful to do a second welfare assessment closer to weaning.

K. Comparisons between EBENE and project-use tool indicators for poultry welfare assessment

Broilers

ID	Indicators	EBENE app	Unit	Project-use indicators for trained observers	Unit
Indic	Availability of the feeders	Yes	score between 0 and 5 **or** cm available / per bird	No	
Indic	Small	Yes	score between 0 and 5 **or** %	No	
Indic	Availability of the drinkers	Yes	score between 0 and 5 **or** cm available / per bird	No	
Indic	Dirty birds	Yes	score between 0 and 5 **or** %	Yes	%
Indic	Litter quality	Yes	score between 0 and 5	Yes	Score
Indic	At rest (inside)	Yes	score between 0 and 5 **or** %	Yes	%
Indic	Perches	Yes	score between 0 and 5 **or** cm available / per bird	No	
Indic	Footpad dermatitis	Yes	Number of birds among 15 handled birds	Yes	Score (Swedish system)
Indic	Bumble foot	No		Yes	%
Indic	Panting (inside)	Yes	score between 0 and 5 **or** %	Yes	%
Indic	Bird distribution (inside)	Yes	score between 0 and 5	No	
Indic	Available space	Yes	score between 0 and 5 **or** kg/m²	No	
Indic	Stretching of wings/legs or wing flapping (inside and outside)	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of behaviour observed inside Frequency of behaviour observed outside
Indic	Range notation	Yes	score between 0 and 5	Yes	Score
Indic	Range use	Yes	**%**	Yes	%
Indic	Wound (inside)	Yes	score between 0 and 5 **or** %	Yes	%
Indic	Lame (inside)	Yes	score between 0 and 5 **or** %	Yes	%
Indic	Immobile (inside)	Yes	score between 0 and 5 **or** %	No	
Indic	Other abnormality (inside)	Yes	score between 0 and 5 **or** %	Yes	%
Indic	Mortality	Yes	score between 0 and 5 **or** %	Yes	%
Indic	Slaughter method at farm	Yes	score between 0 and 5	No	
Indic	Other interventions	Yes	score between 0 and 5	No	
Indic	Aggressive behaviour toward other birds (inside and outside)	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of behaviour observed inside Frequency of behaviour observed outside
Indic	Positive interaction toward other birds (inside and outside)	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of behaviour observed inside Frequency of behaviour observed outside
Indic	Foraging (inside and outside)	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of behaviour observed inside Frequency of behaviour observed outside
Indic	Dust bathing (inside and outside)	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of behaviour observed inside Frequency of behaviour observed outside
Indic	Preening (inside and outside)	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of behaviour observed inside Frequency of behaviour observed outside
Indic	Birds' reaction to human presence	Yes	score between 0 and 5	No	
Indic	Farmer practices	Yes	score between 0 and 5	No	
Indic	Dead (inside)	Yes	score between 0 and 5 **or** %	No	
Indic	Crowd/panic movement of the birds during the assessment	Yes	score between 0 and 5	No	
Indic	Enrichment	Yes	score between 0 and 5	Yes	Frequency of enrichment use observed inside Frequency of enrichment use observed outside
Indic	Catching/Handling	Yes	Qualitative	No	
Indic	Crating	Yes	Qualitative	No	
Indic	Stocking density	Yes	kg/m²	No	
Indic	Duration of non-feeding	Yes	hours	No	
Indic	Water access	Yes	hours	No	

Laying hens

ID	Indicators	EBENE app	Unit	Project-use indicators for trained observers	Unit
Indic	Availability of the feeders	Yes	score between 0 and 5 **or** cm available / per bird	No	
Indic	Small	Yes	score between 0 and 5 **or** %	No	
Indic	Availability of the drinkers	Yes	score between 0 and 5 **or** cm available / per bird	No	
Indic	Litter quality	Yes	score between 0 and 5	Yes	Global score
Indic	Perches	Yes	score between 0 and 5 **or** cm available / per bird	No	
Indic	Footpad dermatitis	No		Yes	Global score
Indic	Bumble foot	No		Yes	%
Indic	Panting	Yes	score between 0 and 5 **or** %	Yes	Percentage of birds panting inside the pen
Indic	Bird distribution	Yes	score between 0 and 5 **or** %	No	
Indic	Available space	Yes	score between 0 and 5 **or** m^2 available / per bird	No	
Indic	Stretching of wings/legs or wing flapping	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of observation of this behaviour inside Frequency of observation of this behaviour outside
Indic	Range notation	Yes	score between 0 and 5	Yes	Global score for range design + distribution on the range
Indic	Range use	Yes	Percentage of birds	Yes	Percentage of birds on the range
Indic	Moving	Yes	score between 0 and 5 **or** %	Yes?	Percentage of birds moving inside the pen
Indic	Wound	Yes	score between 0 and 5 **or** %	Yes	Percentage
Indic	Keel bone damages	Yes	score between 0 and 5 **or** %	Yes	Percentage or global score
Indic	Other abnormality	Yes	score between 0 and 5 **or** %	Yes	Percentage
Indic	Mortality	Yes	score between 0 and 5 **or** %	Yes	Percentage
Indic	Beak trimming quality	Yes	score between 0 and 5 **or** %	Optional	Percentage or global score
Indic	Slaughter method at farm	Yes	score between 0 and 5	No	
Indic	Other interventions	Yes	score between 0 and 5	No	
Indic	Aggressive behaviour toward other birds	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of observation of this behaviour inside Frequency of observation of this behaviour outside
Indic	Positive interaction toward other birds	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of observation of this behaviour inside Frequency of observation of this behaviour outside
Indic	Plumage condition	Yes	score between 0 and 5 **or** %	Yes	Frequency of observation of this behaviour inside Frequency of observation of this behaviour outside
Indic	Foraging	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of observation of this behaviour inside Frequency of observation of this behaviour outside
Indic	Dust bathing	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of observation of this behaviour inside Frequency of observation of this behaviour outside
Indic	Preening	Yes	score between 0 and 5 **or** frequency of behaviour observation	Yes	Frequency of observation of this behaviour inside Frequency of observation of this behaviour outside
Indic	Birds' reaction to human presence	Yes	score between 0 and 5	No	
Indic	Farmer practices	Yes	score between 0 and 5	No	
Indic	Crowd/panic movement of the birds during the assessment	Yes	score between 0 and 5	No	
Indic	Enrichment	Yes	score between 0 and 5	Yes	Percentage of birds using/in interaction with enrichments
Indic	Catching/Handling	Yes	Qualitative	No	
Indic	Crating	Yes	Qualitative	No	
Indic	Stocking density	Yes	kg/m^2	No	
Indic	Duration of non-feeding	Yes	hours	No	
Indic	Water access	Yes	hours	No	