

Manual PIGLOW welfare self-assessment

Fattening pigs



PIGLOW

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Introduction

Why a welfare self-assessment tool

Monitoring animal welfare is valuable to detect particular welfare problems requiring attention and to evaluate effects of management adaptations or trends in time. By periodically assessing the welfare of your animals yourself you can become more aware of many different indicators of animal welfare and associated possible welfare problems. A mobile application can be a useful tool for welfare self-assessments, because it is an easy way to collect, organise and store the data. Additionally, it can include automated advice that will help farmers solve the identified problems. With this in mind, the PIGLOW app was developed.

PIGLOW application

The PIGLOW app was developed by ILVO – in close collaboration with ACTA-ITAVI, IFIP, INRAE, Utrecht University and Yncrea - to allow farmers to self-assess the welfare of their fattening pigs and sows reared in organic and low-input outdoor production systems. It was based on previous welfare assessment tools, namely BEEP, Dierenwelzijn Scan, KTBL tool, ProPIG, SusPigSys and Welfare Quality®. The tool primarily includes animal-based indicators, which means that many of the questions in the app are about the animals themselves instead of just about the environment (e.g. in addition to asking if enrichment is present, we ask if the animals are using the enrichment). The questions about the animals are mostly related to animal health and behaviour (e.g. injuries, lameness, confidence in humans).

Additionally, key questions on management, housing and production parameters are included. The values for these parameters are used to anonymously compare the results of farms that are similar to one another (customized benchmarking). This is an extra function of the app that will allow you to see how the results of your farm for different welfare indicators compare to the results of similar farms. You can also compare your own results over time and easily see if your scores for certain welfare indicators have improved since you started using the app.

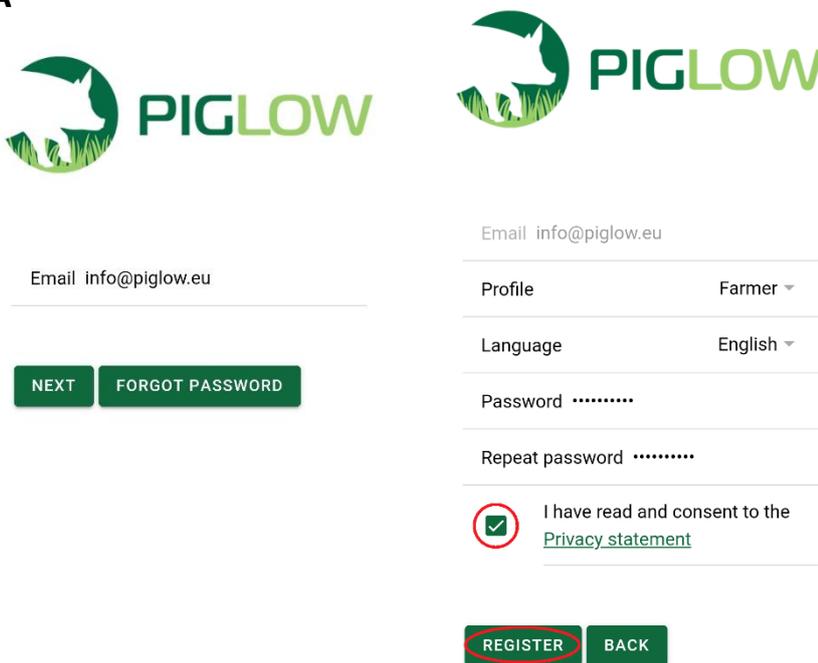
No internet connection is necessary to complete the assessment, only to submit it and receive the results. The assessment can even be closed intermediately and be finished at a later time. After the assessment has been completed, the data will be stored locally until you can submit it. Immediately after submitting your assessment you are provided with the results in PDF form by email and a link to www.piglow.eu, where you will find automated feedback in the form of potential risk factors for all of the measured welfare indicators. If you want to improve your score for a certain welfare indicator, the respective risk factors can serve as a basis for discussion with your veterinarian or other consultant to set-up a tailor-made action plan. While the listed risk factors cover the most common causes of low scores for the corresponding indicators, the list is **non-exhaustive** and it **cannot be guaranteed** that one of them is indeed the cause of the problem.

Downloading of the app and registration

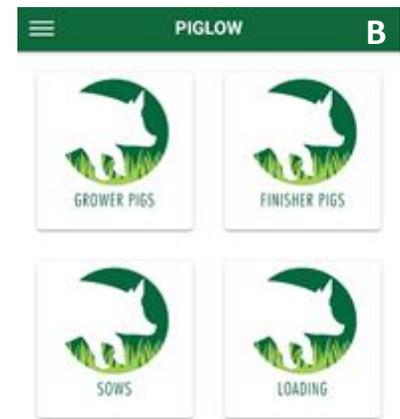
The app can be downloaded for free in the Google Play Store (Android) and App Store (iPhone). Once you open the app, you can enter your email address and press "next" to be redirected to the registration page. You can then select the right type of profile (Farmer, Consultant, Scientist or Student) and language and choose your password. Finally, click "register" to create your account (figure A).

While your email address is necessary to create an account and to receive your results, this email address will be replaced automatically by an artificial code (pseudonymized) before your data is stored in the central data base. This means that no personal data is linked to the results of your assessments.

A



The screenshot shows the registration page for the PIGLOW app. On the left is the PIGLOW logo, which consists of a green pig silhouette in a circle above the word "PIGLOW" in green. Below the logo is an email input field containing "info@piglow.eu". There are two buttons: "NEXT" and "FORGOT PASSWORD". To the right of the email field is a registration form with the following fields: "Profile" (set to "Farmer"), "Language" (set to "English"), "Password" (masked with dots), and "Repeat password" (masked with dots). Below these fields is a checkbox with a checkmark and the text "I have read and consent to the [Privacy statement](#)". At the bottom of the form are two buttons: "REGISTER" (circled in red) and "BACK".



Content and set-up of the PIGLOW assessment

The assessments for fattening pigs, with separate questionnaires for **grower pigs** (weaned piglets) and **finisher pigs** (the stage after growers until slaughter) (figure B), consist of two sections. The first one, called "Office", contains questions related to management practices, production parameters and general information about the farm. This is followed by the section "Group observations" that includes a maximum of 5 group observations to be completed in either the indoor or outdoor areas depending on the distribution of the pigs.

Timing and frequency of assessments

It is recommended to perform one assessment for grower pigs as well as finisher pigs during each season of the year, which equals to eight assessment a year for fattening pigs. If enough animals of the same age are available (at least 40), it is best to perform the assessment when the animals are at the end of either phase. If not enough animals of the same age are available, you can include animals of all available ages within the phase in your assessment so that it represents the average age of the animals.

It is also recommended to perform the assessments when the animals have been housed in the same group for at least 14 days, because the possible social stress associated with being in a new group could influence welfare indicators.

If possible, please start the observation at least one hour after the pigs have been fed to avoid effects of feeding time, such as stress or competition to access the feeder. The aim of the assessment is to record the indicators in a stable context.

Question types

The welfare assessment contains several different types of questions. For some of the questions, the answers can be typed freely in a **text field**. If the answer is supposed to be a **number**, a key pad with only numbers will be visible. These questions can have a minimum or maximum value. For example, it is not possible to answer with a number above 100 if the answer represents a percentage (figure C). If the answer must be given in words, a key pad with letters will be visible.

The image shows three screenshots of a mobile application interface for a welfare assessment questionnaire, labeled C, D, and D.

Screenshot C: Shows a questionnaire titled "Questionnaire C" with a progress bar at 5%. The question is: "What is the average mortality rate (%) in the grower phase (on a yearly basis)?" The answer field contains "120". Below the answer field, it says "Maximum value 100." A numeric keypad is visible at the bottom.

Screenshot D: Shows a questionnaire titled "Questionnaire D" with a progress bar at 4%. The question is: "Date of the scan". The answer field contains "13/07/2020". A date picker keypad is visible at the bottom.

Screenshot D: Shows a questionnaire titled "Vragenlijst D" with a progress bar at 4%. The question is: "Date of the scan". The answer field contains "13/07/2020". A list of dates is visible at the bottom, with "13 07 2020" selected. The "DONE" button is circled in red.

			CANCEL	DONE
11	05	2022		
12	06	2021		
13	07	2020		
14	08	2019		
15	09	2018		

Several questions ask for a **date** (figure D). To select the right date, click on the date of today that is automatically shown. A window will open in which you can scroll to the correct day, month and year. After selecting the right date, press “Done” to confirm your answer.

The assessments also contain **yes/no questions**. Simply select one of the two options before continuing with the next question.

There are two different types of **multiple choice questions**, namely one where only one answer can be selected and one where multiple answers can be selected. For the first type, there are circles in front of each answer (figure E) and for the second type there are squares (figure F). For some questions, it is necessary to scroll down to be able to see all answer options. You will easily see for which questions this is the case, because the arrow button to continue to the next question will only be visible below the last option, thus you cannot continue to the next question without scrolling down.

Finally, there are questions that are answered by **counting** the number of occurrences of a specific indicator by pressing the **+ button** for each occurrence that you observe (figure G). If you clicked by accident, you can remove one occurrence by pressing the **- button**. If you accidentally end up with a negative number as your total, it will not be possible to continue to the next question (figure H).

← Questionnaire E

6%

Office

What is the **age of weaning**?

- < 28 days
- 28-39 days
- 40-45 days
- 46-50 days
- > 50 days

← →

← Questionnaire F

19%

Office

Which type(s) of **enrichment** is/are provided **indoor**? ⓘ

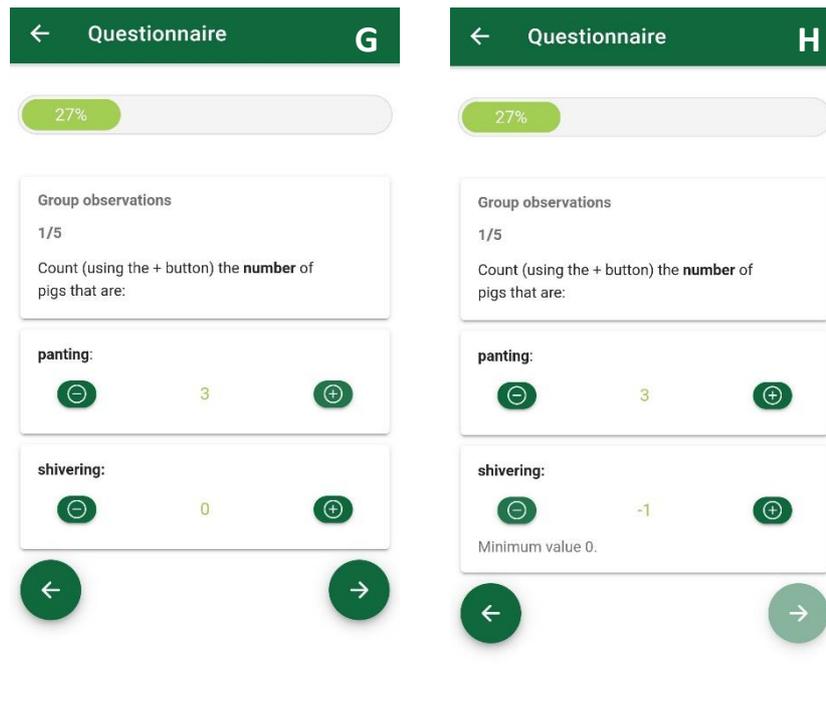
- straw - roughage
- fixed wood
- loose wood
- burlap sack
- chain
- fixed toys (by chain or bar)
- loose toys
- soil

← →

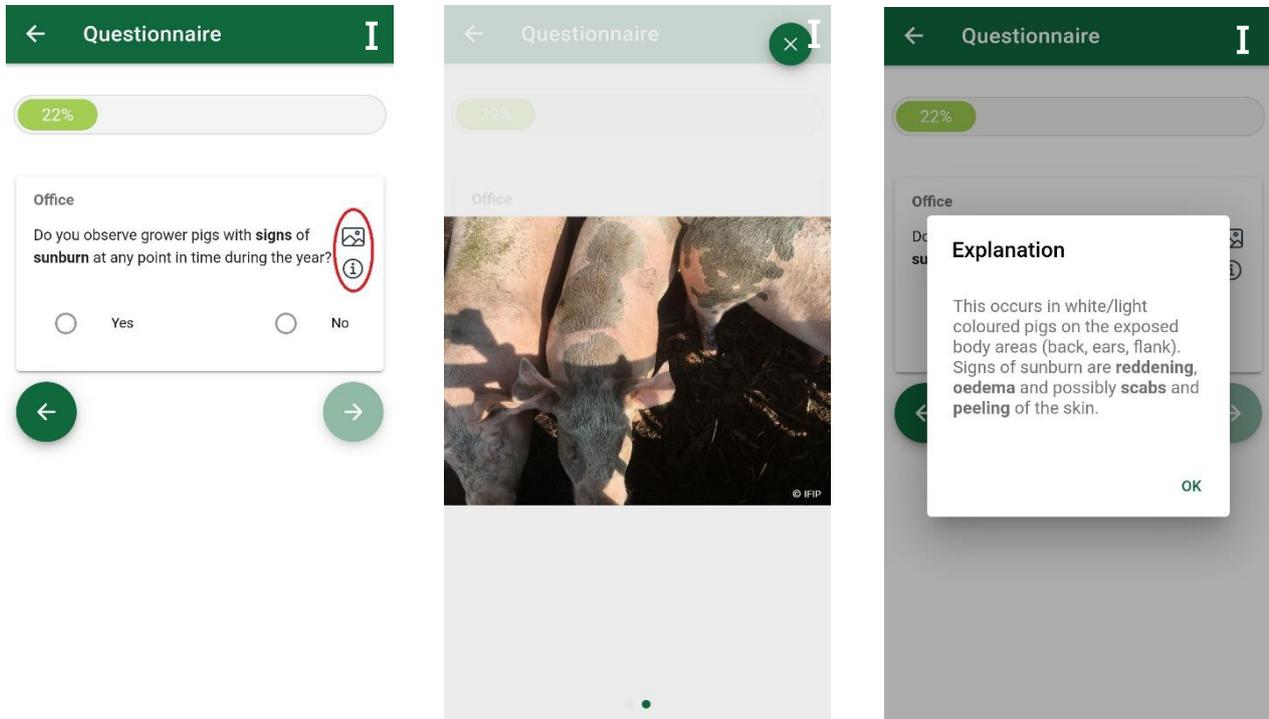
← Questionnaire F

- straw - roughage
- fixed wood
- loose wood
- burlap sack
- chain
- fixed toys (by chain or bar)
- loose toys
- soil
- other
- none

← →



Some questions contain **photos** or an **additional explanation** to clarify the meaning of the question. Photos and explanations can be found under the **image-icon** and the **i-icon**, respectively (Figure I).



Office

This section of the assessment should be completed in a location where you have access to data on the animals and the buildings. Unless stated otherwise, you should answer the questions using data from the last 12 months.

If you have already completed an assessment in the past, you will see the previously introduced answers for some of these questions. You should check whether these answers are still correct and modify them if necessary.

The questions in the office section mainly concern general information about the farm. This information is collected to get an idea of, for example, the size of your farm and the management practices that are applied, but will not be used to calculate any kind of score for your farm. If data have been collected from a large enough number of farms, this information could possibly be used (anonymously) to detect a relation between some of these factors and the behaviour or welfare of the animals. It could also be used to compare your farm more specifically to farms that are similar in size or that apply the same management practices.

The only exceptions are the questions concerning the average mortality rate, use of the outdoor area and signs of sunburn. These are considered as actual welfare indicators.

Question – Mortality rate

What is the average mortality rate (%) in the grower or finisher phase (on a yearly basis)?

Explanation

The mortality rate is a measure for the general health of the animals. It is mostly influenced by the presence of diseases and other health conditions, which are often a consequence of insufficient hygiene or unsuitable management practices.

Risk factors

- Hygiene
- (Infectious) diseases
- Other health conditions (infections, injuries, skin conditions)

Question – Use of the outdoor area

Are there any parts of the outdoor area that are rarely used?

Explanation

If this is the case, this says something about the behaviour of the animals and about the suitability of the outdoor area. If the area that is not used is the furthest away from the building or huts, this points to a less exploratory attitude of the animals. Exploratory behaviour is an important natural behaviour for pigs that should be stimulated, for example by providing frequently changing enrichment.

If one or several specific spots of the outdoor area are not used, this could also indicate that there is something in the environment that is unpleasant to the animals.

Risk factors

- Not enough stimulation of exploratory behaviour
- The presence of unpleasant stimuli in the outdoor area (can be related to flooring, vegetation, increased predation risk, unpleasant noises, etc.)

Question – Signs of sunburn

Do you observe pigs with signs of sunburn at any point during the year? Y/N

Explanation

This occurs in white/light coloured pigs on the exposed body areas (back, ears, flank). Signs of sunburn are reddening, oedema and possibly scabs and peeling of the skin.

Sunburn is very painful for the animals and is therefore a serious health risk. It will occur when the free-range does not provide enough shade/shelter and the animals have no choice but to stay in the sun.

Risk factors

- Lack of areas in the shade

Group observations

Selection of groups

For the group observations it is important to select a representative group of animals. If you have fewer than 50 grower or finisher pigs, you should assess all of them. If you have 50 or more grower or finisher pigs, you should assess at least 50 pigs from, if possible, at least 2 different pens. Select pens that are evenly distributed throughout the housing unit to ensure a representative sample.

For each pen, you may choose to assess the animals either inside or outside, depending on where the majority of the animals is situated or where visibility is best. Include all animals from the pen that are visible in your assessment. The number of group observations depends on the number of available animals, with a maximum of 5.

Questions and explanations

Question – Group composition

Have the pigs been housed in this group for at least 14 days?

Explanation

This information is important because tension or social stress are sometimes higher in groups of animals that have only been together for a short time. Therefore, values for certain welfare indicators that are related to aggression within the group could be elevated in these groups. For this reason, it is recommended to observe groups that have been together for at least 14 days.

Question – Number of pigs

How many pigs are observed for this assessment?

Explanation

The total number of pigs that is included in the assessment is needed to calculate percentages of pigs based on the answers of other questions (e.g. the percentage of pigs that is panting can be automatically calculated after counting both the number of pigs that are panting and the total number of pigs).

Question – Thermal comfort

Observe how the pigs are distributed throughout the pen. Is more than 50% of the pigs:

- Huddling Yes/No
- Widely spread on their flank Yes/No

Count (using the + button) the number of pigs that are:

- Panting - 0 +
- Shivering - 0 +

Explanation

These behaviours are all indicators of thermal comfort.

“Huddling” is defined as lying with more than half of its body in contact with another pig (i.e. virtually lying on top of another pig).

Huddling and shivering could indicate that the animals are cold and trying to get warm. Panting or lying widely spread on the flanks could indicate that the pigs are too hot and trying to increase contact with the floor to lose heat.

Risk factors

- The temperature is above or below the limit of the thermal comfort zone
- Climate control/ventilation is not optimal
- Design of the free-range is not optimal (lack of shelter, lack of shade)
- Floor type (holds too much or not enough heat)

Question – Enrichment use

Record the number of pigs that are using the enrichment in this pen.

Explanation

When answering this question, please take into account the types of enrichment that you selected earlier as answers to the question about the types of enrichment that are present indoors and outdoors.

Enrichment allows animals to express natural and species specific behaviour, which is very important for good animal welfare. If the enrichment is not used by many animals, this could indicate that the provided enrichment is not right for them.

Risk factors

- The enrichment that is provided is not species appropriate
- The enrichment has been present for too long and is not interesting anymore
- The enrichment is too dirty for the animals to use
- There is not enough enrichment for a group of this size

Question – Drinking water

Might some animals in the group have difficulty accessing good quality drinking water at some point in time? Yes/No

Explanation

The animals could have trouble accessing drinking water for different reasons. A factor can be that there are not enough drinkers for the size of the group, but even more important is the flow rate. If this is too low, the animals need to drink for a very long time to drink enough water.

Also important is the location of the drinkers. For example, if all drinking places are very close together or too close to the feeding place, the access to some drinkers could be blocked by other pigs that are eating or drinking and aggression could develop.

Risk factors

- Not enough drinkers, which could lead to competition
- The flow rate is too low (should be 0,7-1 L/min for growers and 1-1,5 L/min for finishers)
- Drinkers are broken
- The drinkers are too close together or to the feeding place and cannot all be used at the same time without a risk of negative social interactions

Question – Liquid faeces

Do you observe any signs of liquid faeces in the pen (on walls or floor)? Yes/No

Explanation

Liquid faeces are a sign of problems of the digestive system. It is particularly common in grower pigs shortly after weaning, when the animals experience many changes. One cause of liquid faeces can be a too high protein content in the feed after weaning, when the digestive system of the pigs is still getting used to solid food. Another cause can be social stress caused by being housed in new groups, away from their mother.

Additionally, liquid faeces can be a sign of compromised health, such as an infection.

Risk factors

- Diet (protein content after weaning is too high)
- Social stress
- General health condition
- Infections
- Hygiene

Question – Too small

How many of the pigs are too small compared to group members (click the + button)? - 0 +

Explanation

“Too small” is defined as 1/3 smaller than the average pig in the group. A small pig may be the result of a previous health problem or (social) stress.

The way in which the animals are divided over the groups is an important factor. If a small pig is placed in a group where the other individuals are much bigger, it could have difficulty accessing food and water. In that case, that pig would continue to grow more slowly and might show aggression or bite the tail of others to try to get access to food. Often, these pigs also show a reduced physical condition compared to the other animals in the group.

Risk factors

- Management
- Previous health issues
- (Food) competition
- Social stress

Question – Bad general state

Count (using the + button) the number of pigs that are in a bad general state - 0 +

Explanation

“Bad general state” is defined as animals which are obviously in pain, sick, in need of further care to avoid complications, dull or apathic (not bright, alert and responsive), isolated from the group (lying, standing, eating), with dull/sunken eyes, blue/red ears or snout, pale skin colour, rapid respiration, and animals with a physical deformation or large hernia (bigger than the distance between the actual hernia and the floor).

These pigs need to be assessed thoroughly and a veterinarian needs to be consulted if required. Proper care should be given.

Risk factors

- Illness
- Injuries
- Hygiene

Question – Laboured breathing

How many pigs display laboured breathing (use the + button)? - 0 +

Explanation

The animals should breathe calmly. Laboured breathing (pumping) could indicate an infection of the respiratory system or that the climate in the environment is not optimal.

Risk factors

- Humidity (too high or too low)
- Insufficient ventilation
- Infection

Question – Covered with faeces

How many pigs are covered with faeces/manure (use the + button)? - 0 +

Explanation

“Covered” is defined as having faeces/manure on at least 50% of the skin surface on one side of the body.

If there are many pigs covered in faeces, this is a sign of unsuitable housing. For example, there might not be enough space for a large percentage of the animals to lie down in the area that is meant for this, which could lead to animals choosing to lie down in the dunging zone. The temperature is also of influence. If the temperature is above the thermal comfort zone, the pigs will choose to lie further away from each other, which means they need more space. Additionally, a high temperature could lead to the pigs rolling through faeces in an attempt to cool off and lose internal heat. This is unhygienic and could lead to contamination with pathogens. Another important factor is the bedding material. If there is not enough of it or it is not changed frequently enough, it will contain more faeces.

The chance of pigs being covered with faeces will increase if there are pigs with liquid faeces/diarrhoea in the group. Thus, it could also indicate that there are pigs with problems of the digestive system in the group.

Note that this parameter should not be confused with dirtiness: An outdoor pig soiled with mud does not necessarily indicate a welfare problem. This may be thermoregulatory behaviour (cooling off during hot weather) or a way to protect against external parasites.

Risk factors

- Unsuitable housing (not enough space to lie down, no clear functional zones, bedding material)
- The temperature is above the limit of the thermal comfort zone
- Pigs with diarrhoea

Question – Skin lesions

Count (using the + button) the number of pigs with:

- Any skin wounds larger than 5cm (flank, legs) - 0 +
- At least 15 scratches on one side - 0 +

Explanation

The presence of large skin wounds or scratches can be an indicator of aggression amongst the animals in the group, for example during feeding time. For the victims, the lesions can be painful and open wounds could get infected and form a serious health risk.

Skin wounds can also be a symptom of dermatitis, most often caused by *Staphylococcus* bacteria. Dermatitis is more likely to develop when the skin is already damaged, the humidity is high and the skin is covered in grease or faeces.

Risk factors

- Social stress
- Feeding competition
- Unsuitable housing (too small, not enough space to avoid dominant group members)
- Overstocking
- Infections

Question – Other lesions

Count (using the + button) the number of pigs with:

- Any ear lesions - 0 +
- Any tail lesions - 0 +

Explanation

Ear- and tail lesions, which are usually caused by bites from another pig, can be painful and can also lead to infections, which form a health risk.

In addition, the presence of these lesions points to problems in the biter (stress, behavioural problems or feeding problems). Providing the animals with enrichment could help to reduce behavioural problems by reducing boredom. One element of the feed that has been associated with biting is a mineral deficiency.

Risk factors

- Stress
- Not enough or unsuitable enrichment
- Feeding competition
- Composition of the feed (e.g. mineral deficiency)

Question – Skin irritation

Count (using the + button) the number of pigs with:

- Any signs of skin irritation or parasites - 0 +

Explanation

Skin irritation may be indicated by pigs scratching excessively on fittings. Signs of mange may include little red spots all over the body of the pig. In addition, animals may be being irritated by flies or lice may be visible (typically on the udder and or perineum). The presence of parasites may indicate that the housing environment is not clean enough.

Risk factors

- Hygiene
- Insufficient parasite control

Question – Lameness

How many pigs are obviously lame (use the + button)? - 0 +

Explanation

“Obviously lame” is defined as clearly visible reduced weight bearing on one limb ("limping") up to the animal being unable to walk.

Lame animals are in pain and will have difficulty reaching food and water. Lameness can also reduce the capacity for showing behaviours such as exploring or avoiding group members when there is a risk of aggression.

Vitamins and minerals in the feed are an important factor. If the concentrations are too low, this could have a negative impact on bone strength and the skin quality. If too much feed has to be eaten to obtain the right amounts of vitamins and minerals, this will lead to too rapid growth and damaged cartilage.

Risk factors

- Unsuitable floor (slippery, too hard, damaged slats)
- Insufficient amount of bedding material
- Wet bedding material (slippery)
- Inflamed joints
- Too rapid growth, which can lead to damaged cartilage
- Feed composition (vitamin and/or mineral deficiencies)

Question – Approach test

Note the time (in seconds) until the first pig approaches and touches you after you have entered the pen.

Explanation

Before starting the test, enter the pen and walk around calmly to ensure that all the animals have noticed you. Once you are standing still, start the timer and record how long it takes for the first pig to approach and touch you. If no pig touches you within 60 seconds, stop the timer and end the test.

The approach test is a measure for the confidence of the pigs in humans. If no pigs approach, this could indicate that the presence of humans is viewed as a negative thing by the animals. This could either be the case because humans do not visit often enough and the animals are not used to it, or because humans behave unpleasantly during their visits (e.g. are too loud, move too fast or too suddenly).

A failure to approach humans could also indicate that the environment in general is not stimulating enough for the animals. Pigs that are used to being surrounded by (new) stimuli are more likely to react positively to the presence of new stimuli, including the presence of humans.

Risk factors

- Human visits are too infrequent, so the animals are not used to it
- Humans behave unpleasantly during visits
- The environment is not stimulating enough

Question – Coughing and sneezing

Did you hear any coughing and/or sneezing in this group during this assessment? Yes/No

Explanation

Coughing and sneezing are indications of problems of the respiratory system, which could mean that the air quality in the environment is not optimal. Ventilation of the air could be an important factor, where too much ventilation could lead to too much cold air, but not enough ventilation could lead to a higher concentration of harmful particles in the air. Air that is too dry or too humid could also affect the airways.

Risk factors

- Air quality (too much or not enough ventilation)
- Humidity (too high or too low)
- Dust
- Infections

Remarks

At the end of the assessment you will have the opportunity to add remarks. In this field, please record any additional information that might be relevant for the interpretation of the results of the assessment. This could be things such as a heat wave or a recent disease outbreak.

Results and feedback

To see the results of your assessment and receive automated feedback, upload your answers by clicking on the cloud icon. The answers can only be uploaded in a location with internet access. Before uploading your answers, please confirm whether your assessment is accurate and valid. If you select "no", you will still receive your personal results, but your data will not be used for benchmarking.

After uploading the answers, you will receive a report in PDF format with your results by e-mail. The results are compiled by calculating percentages for many of the answers that you have given to all the questions. Each question is linked to a welfare principle, such as "good health" or "good housing". In the report, the answers of questions in the same category will be shown together to give a clearer overview of the types of aspects that you score well or less well on. If you have a low score for multiple questions in the same category, this means that improvements can be made to, for example, management practices or factors of housing related to that category that would lead to better animal welfare.

The e-mail with the report will contain a link to a more extensive version of the report on the PIGLOW website (www.piglow.eu). There you can consult all your reports and the risk factors for all welfare indicators (using your e-mail address and password of the PIGLOW app).

If you confirmed that you performed an accurate and valid assessment, you can see (under the header "reports") how your results compare to those of (anonymous) other farms. The comparison will be shown in the column "benchmarking". For each question for which benchmarking is possible, this column will contain "Pxx" where "xx" are two numbers indicating the percentage of farms that scored lower than yours. For example, P10 means that 10% of the farms have a lower score and 90% have a higher score. P70 means that 70% of the farms have a lower score and 30% have a higher score. Thus, the higher the number, the better you scored compared to other farms. However, a low percentile-score does not necessarily mean that your farm performs badly on that welfare indicator.

In addition, some indicators that are considered to be very important are also shown in a "welfare radar". In the welfare radar, all indicators are displayed on a scale of 0 to 100, where 0 is very bad and 100 is a perfect score. To this radar, you can add benchmark lines that indicate the values of the lowest scoring 10%, 50% and 90% of the farms. The closer your score comes to the outside of the radar compared to these lines, the higher you scored relative to other farms. Furthermore, you can compare the scores of your latest assessment to your own previous scores to see if your scores for any of the indicators have improved.

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