Animal Welfare indicators in Swedish pig production

Djurvälfärdsindikatorer i svensk grisproduktion

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Swedish University of Agricultural Sciences, SLU
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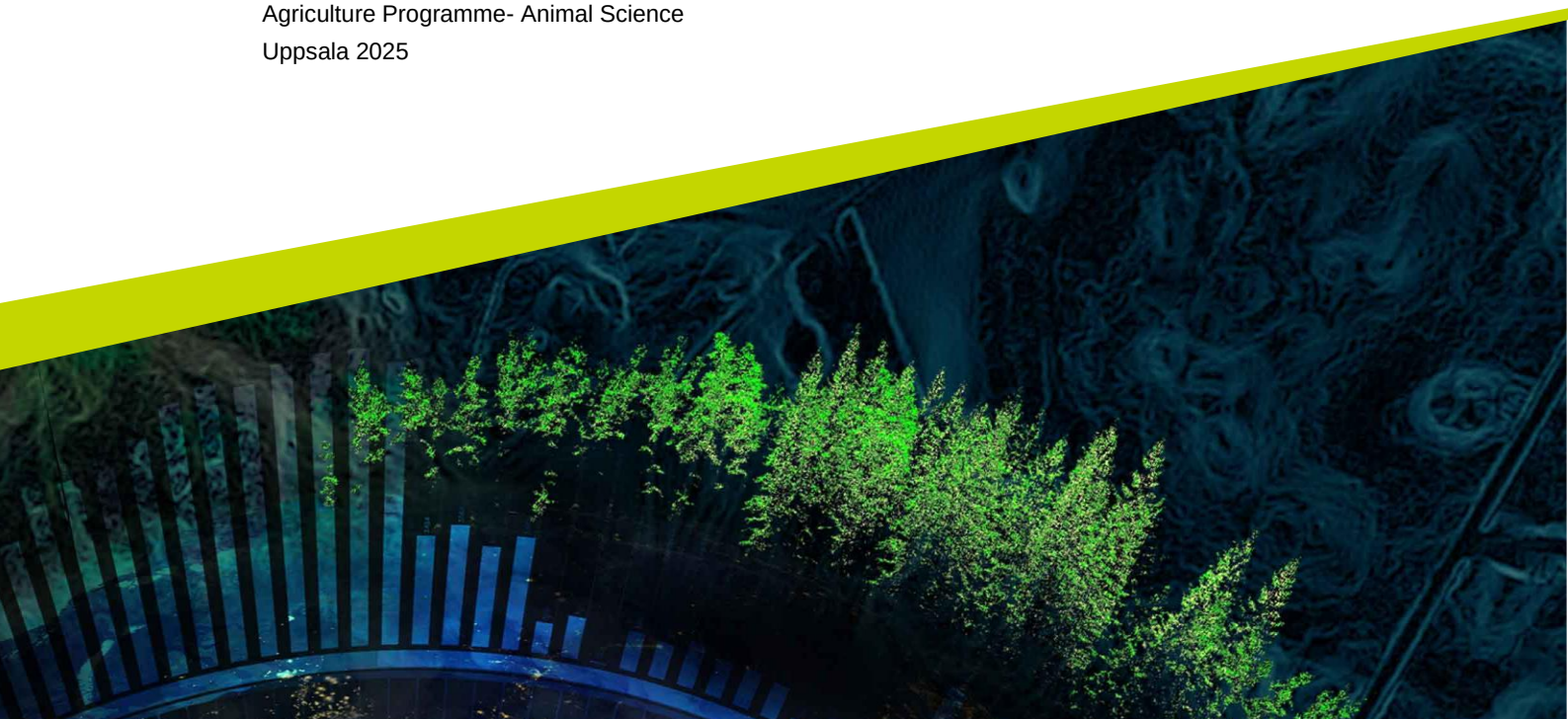

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Abstract

Sweden's pig production is regulated by legislation that sets high standards for animal welfare. As a result, Swedish pigs generally have a high level of animal welfare. Currently, there is no welfare assessment tool specifically adapted to Swedish pig production. This thesis was part of the project "Ask the Pig", which aims to develop a welfare tool tailored for Swedish pig production and to be used for advisory and benchmarking purposes. The aim of the thesis was to quantify and describe the variation in animal-based welfare indicators in Swedish pig production. The study included data from 27 commercial pig farms in Sweden, which were assessed as medium to large in herd size. Data were collected from welfare assessments conducted between July 2022 and September 2023. 11 animal-based welfare indicators were evaluated on-site, either at unit, pen, or sow level, depending on the indicator. The assessments were carried out across all sow unit types (farrowing, gestation, and mating). The results show that almost all of the indicators included in the study could be observed at least once during the farm assessments. The findings revealed substantial difference between farms in the prevalence of most of the examined indicators and identified associations between the indicators that could be of practical relevance. The study demonstrates that there is room for improvement in animal welfare on Swedish pig farms and that all the indicators assessed in the study should be included in a future welfare assessment tool. Future research of interest is to investigate the factors underlying the observed variation, as well as the general associations between welfare indicators.

Keywords: welfare, assessment, sow, swine, pork production, animal-based indicators, measurements, benchmarking

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1. Introduction

1.1 Pig production in Sweden

Sweden has a relatively small pig production in an international comparison, mainly supporting the Swedish pork market, and the production process has several characteristics that diverge from international standards, e.g. relatively high animal welfare standards. Swedish pig production accounted for about 1% of the total pig production within the EU in 2013 (LRF, n.d.). In 2013 there were approximately 148 066 sows (including gilts) in Sweden (Swedish Board of Agriculture, 2013), and in 2024 the same number were approximately 116 061. The number of companies with piglet production reached 751 in 2024, which is a decrease compared to the year 2000 when there were 3 218 companies that had sows and gilts (Swedish Board of Agriculture, 2024a). In 2024, Sweden's self-sufficiency rate for pork was 82% (Swedish Board of Agriculture, 2024b).

Sweden has national animal welfare legislation that imposes higher minimum requirements compared to the minimum requirements set by EU legislation (Wallenbeck *et al.,* 2024). For example, even though tail docking is prohibited by EU legislation (Council Directive 2008/120), tail docking is still a routine in most other EU member states (Wallenbeck *et al.,* 2024). In Sweden, routine tail docking has been banned since 1988 and may only be performed on veterinary advice. Due to tail docking being prohibited in Sweden, higher standards for housing and resources are required to reduce and prevent the occurrence of tail biting (Wallenbeck *et al.,* 2024). Examples of areas where Swedish animal welfare legislation exceeds EU legislation include larger available space per pig, larger available space at feeding sites based on live weight, and access to bedding material for enrichment. In Sweden the confinement of sows is not allowed in any production stages, whereas in the EU it is permitted for four weeks during lactation and four weeks after insemination. Furthermore, slatted floors in Swedish pig production may only constitute 35% of the available floor space for the animals, unlike EU legislation which does not impose any requirement on this (Wallgren *et al.,* 2019).

In Sweden antibiotics may only be used used when prescribed by a veterinarian and prescription of antibiotics is regulated by legislation. In Sweden, veterinarians are not allowed to profit from prescribing prescription medications (Björkman *et al.,* 2021), which can help prohibit unnecessary use of antibiotics. Batch-wise management system involves moving sows between departments simultaneously and is predominantly used within Swedish pig production. This is advantageous from a biosecurity perspective as it allows for cleaning, disinfection, and

downtime between batches, which helps to prevent the spread of infections and further reduces the need for antibiotic use (Einarsson *et al.*, 2014).

There are many different ways to house sows and gilts in Swedish pig production. It mandated that sows must be kept in pairs or groups but may be housed individually for one week before and during farrowing (2 chap. 8§ Swedish Board of Agriculture's regulations and general advice [2019:20] on pig farming in agriculture etc, casenr L106). It is also legally required that pigs must have bedding in an amount that meets the animals' needs for enrichment and comfort, and that sows and gilts must have bedding materials that satisfy their need to build a nest during the week before farrowing (4 chap. 4-5§ Swedish Board of Agriculture's regulations and general advice [2019:20] on pig farming in agriculture etc, casenr L106). In conventional pig production, a common method of housing during the period after weaning until insemination is to keep sows in groups on deep litter bedding with individual feeding stalls that can be closed during feeding time. During the period between insemination (or natural mating) and farrowing, the sows are also kept in larger groups and are then moved to individual farrowing pens when it is time to give birth (Einarsson *et al.*, 2014). The sow is then housed individually with her piglets until they are weaned at the earliest age of 28 days (with exceptions).

Sows can be kept either in dynamic or static groups. In static group housing, only new sows that have had their first litter are introduced into the large group after weaning (Verdon *et al.*, 2015). Otherwise the same individuals are kept together in static groups, which closely resembles the group housing of wild boar sows (Jensen, 2002). Static groups are common in batch-wise production systems, where sows move between units simultaneously, resulting in the same sows being able to be kept together for several parities. In dynamic group housing, sows are kept together in a large group where new sows are regularly introduced or removed from the group, e.g. before farrowing. This means that groups are regularly remixed, resulting in constantly changing group dynamics (Verdon *et al.*, 2015).

1.2 Animal welfare definitions

Although there is no universal accepted definition of animal welfare, there are several accepted definitions that describe the concept of animal welfare in various ways. The Five Freedoms are a concept for achieving animal welfare that was developed by The Farm Animal Welfare Council of the UK (hereafter FAWC). FAWC developed the Five Freedoms based on a report written by Brambell in 1965, and outlined how the freedoms should be achieved. The Five Freedoms developed by FAWC are as follows: 1. freedom from hunger and thirst, 2.

freedom from discomfort, 3. freedom from pain, injury, and disease, 4. freedom to express normal behavior, 5. freedom from fear and distress (Appleby, 2008). Broom (1986) instead describes animal welfare as an individual's ability to cope with its environment. The same author explains that a reduced ability to cope with the environment results in decreased welfare for the individual. The World Organisation for Animal Health (hereafter OIE) defines animal welfare as an animal's physical and mental state in relation to the environment in which it lives and dies (OIE, 2016). The three descriptions mentioned so far aim more to describe the absence of poor animal welfare rather than to describe good animal welfare. The Five Domains model of animal welfare is a model that describes animal welfare through five different domains, where each domain contains both negative and positive indicators. The domains of the model are as follows: 1. nutrition, 2. physical environment, 3. health, 4. behavioral interactions, 5. mental state. The first four domains can be good or bad and will collectively affect the animal's mental state through negative and positive experiences (Mellor *et al.*, 2020).

1.3 Animal welfare indicators

When assessing animal welfare, the indicators evaluated are typically divided into two general categories: resource- and management-based indicators (input) and animal-based indicators (output). Resource- and management-based indicators refer to the resources provided to the animals and how the production is managed. Examples of resource-based indicators include the amount of available space for the animal, the quantity of bedding material available, and water quality provided. Management-based indicators can include how often the pen is cleaned, whether pain relief is provided when necessary, or the farm's breeding strategy. By evaluating animal-based indicators, insights are gained that indicate how the animal is affected by resources and management, as well as their impact on the animal and can be used to assess an animal's welfare. Examples of direct animal-based indicators are behavior, cleanliness, and injuries. There are also indirect animal-based indicators such as growth and culling rate (EFSA, 2012).

Previous legislation on animal welfare and regulations for certification has mainly focused on resource-based and management-based indicators. Recently, the use of animal-based indicators has been advocated by e.g. the EU Welfare Quality® project incorporating this type of indicators when developing its welfare protocol. The advantages of animal-based indicators are that they provide a more accurate picture of the animal's actual welfare, regardless of the production system the animal is in (Pandolfi *et al.*, 2017).

By using animal-based indicators that can be assessed independently of production systems, it enables comparisons both within a farm and between farms. Another reason why animal-based indicators are advocated is that the assessments carried out at the individual level can be used to gain insight at the group level by looking at the proportion of individuals within a group that have been scored for a specific indicator. Furthermore, this allows for comparison of results as well as monitoring of them (Vannier *et al.,* 2014). According to EFSA (2012), animal-based indicators can be used by farmers to identify changes in animal welfare as a result of any modifications made. They can also be used for advisory purposes by e.g., herd veterinarians (EFSA, 2012).

While resource-based indicators are relatively easy to assess (such as assessing space allowance), animal-based indicators often place higher demands on the assessor. The assessments can take longer to perform and may involve more costly assessment methods. When selecting animal-based indicators to include in an animal welfare scheme, Lundmark (2016) emphasizes that it is important for the indicator to be chosen based on the criteria of validity, reliability, and feasibility. Validity means that assessment of an indicator evaluates what it is intended to assess, and nothing else. Reliability means that the assessment should be repeatable and yield similar results, e.g. regardless of the assessor. For an indicator to be feasible means that it should be realistic to perform (e.g. economically and practically) and relatively easy (e.g. should not take too long, be dangerous or stressful) to assess (Lundmark, 2016).

1.4 Animal welfare assessment

The purpose of ensuring compliance with regulations in legislation and private standards is partly to maintain a standard across various areas (e.g. animal welfare), as well as to create and uphold public trust that these standards are being followed (Lundmark, 2016).

1.4.1 Animal welfare legislation

In Sweden, the country's 21 County Administrative Boards are responsible for ensuring compliance with animal welfare legislation. In each county, animal welfare officers work to ensure that legislation is complied with. Each county aims to inspect 10% of animal keepers (including farms) annually, where the subjects of inspection are partially selected based on a risk-based system. This implies that those farms and other animal keepers assessed to have a higher risk of deficiencies in their animal husbandry are prioritized. Inspection subjects are also chosen randomly. This selection system can result in some cases where several years may pass before an inspection occurs. During inspections, the animal welfare officer checks that the animal keeper adheres to the minimum standards

set forth in the relevant legislation. For routine inspections, the animal keeper is usually contacted in advance to be informed about the visit. However, the animal keeper is typically not contacted more than a day before the inspection is to take place, as the visit is meant to reflect reality (Swedish Board of Agriculture, 2022).

1.4.2 Animal welfare certification

In Sweden, compliance to private standards (such as KRAV and Svenskt Sigill) typically occurs through second-party or third-party audits. For second-party audits, auditors from a company that the farmer is dependent on are performing the inspections, e.g. an advisor. For third- party audits, auditors from an accredited and independent company visit the farm and conduct inspections aimed at ensuring compliance with the regulations. Third-party audits are used to enhance the credibility and transparency of the standard. All farms affiliated with a private standard are regularly inspected, but the time interval between inspections varies (Lundmark, 2016).

1.4.3 Animal-based indicators for benchmarking

It is becoming increasingly common to use benchmarking to monitor and identify changes occurring among the animals on the farm. This makes it possible to improve results as previous assessments for animal-based indicators are available for comparison. Regular follow-up of results can be used as a practice in good management. By comparing assessments for the same animal-based indicators across different farms, it allows for the examination of differences between farms. By identifying normal values for the animal-based indicators, they can be used to identify farms that deviate from the normal range of variation (EFSA, 2012).

For an indicator to be relevant to include in a welfare tool, it is advantageous that there is some variation in the prevalence of the indicator, either over time within a farm, between farms, between units, or between pens. If an indicator does not occur at all, or only to a small extent, the opportunities for improvement are limited.

Currently, there is a lack of collected data on animal-based welfare indicators in Swedish pig production that can be used for such comparisons.

1.5 Animal welfare schemes

Animal welfare schemes aim to ensure a certain level of animal welfare by controlling that the established requirements are met. The level set by the scheme constitutes a minimum standard of requirements that must be fulfilled to facilitate good animal welfare. On one hand, participation in an animal welfare scheme can

be motivated by a producer's desire to enhance the welfare of their animals, but it can also be driven by the fact that the product gains added value on the market. There is also consumer demand for products that can guarantee that animals have experienced good welfare throughout their lives. Most animal welfare schemes are characterized by a standard containing various rules that producers must meet to affiliate to the scheme. Affiliation also means that production is monitored to ensure compliance with the established requirements. Many animal welfare schemes utilize resource-based, management-based, and animal-based indicators, even though the use and distribution of these different indicators vary depending on the scheme (Main *et al.*, 2001). As previously stated, the majority of the requirements included in animal welfare schemes and animal welfare legislation have been resource and management-based indicators, while the interest in animal-based indicators is increasing.

There are currently many different animal welfare schemes available. AssureWel is the name of a project that ran between 2010-2016 and involved various stakeholders. The project aimed at developing species-specific welfare protocols and evaluating the results from the assessments. One reason for evaluating the results was to use them for benchmarking in order to further help farmers to improve their results. The protocols developed to assess animal welfare are partly based on animal-based indicators (AssureWel, n.d.a). The protocol created for pigs (dry sows and finishing pigs) includes 16 assessment points, and examples of animal-based indicators that are included are tail docking, leg swellings, and lameness (AssureWel, n.d.b). The Welfare Quality® research project was a project that ran between 2004-2009 within the EU that developed four principles for good animal welfare, each containing 12 criteria. The principles for animal welfare that the project defined are good health, good housing, good feeding, and appropriate behavior. The project was among the first to include many animal-based indicators in the protocols, and examples of indicators included in the welfare protocol for pigs are body condition score, shoulder sores, and huddling (Welfare Quality, 2009).

1.6 Challenges using international welfare schemes in Swedish pig production

In Sweden, there is no standard with the sole purpose of promoting the welfare of pigs. However, there are several different quality standards that include requirements to enhance animal welfare. In addition to pig farmers adhering to Swedish animal welfare legislation, which imposes stricter demands on animal welfare compared to the EU's, there are often requirements from retailers, slaughterhouses, and consumers that production must be linked to a quality standard. The stricter requirements imposed on pig producers in Sweden

regarding animal welfare compared to requirements within the EU, have put higher demands on them. This means that the pig producers that remain active maintain the high standards that exist for the welfare of pigs (Bruckmeier & Prutzer, 2007).

The international animal welfare schemes that exist today are not adapted to Sweden's already high standards for animal welfare. It can be speculated that Swedish farmers would achieve favorable results for good animal welfare by using an international animal welfare scheme. Favorable results would further mean that the scope for improving their outcomes would be limited.

1.7 Aim

This master's thesis is conducted as part of the project “Ask the Pig”, which aims to develop an animal welfare benchmarking tool adapted to Swedish pig production. The tool is intended to be used by producers, advisors, certification bodies, and during procurement, and aims to improve the welfare of pigs as well as to increase the competitiveness of Swedish pig producers. For cattle, a corresponding benchmarking tool is already available in Sweden, called “Ask the Cow”. The tool, developed by the advisory company Växa, is used both in advisory contexts and as an improvement tool for animal welfare within the organic product standard KRAV.

To develop a corresponding benchmarking tool adapted to Swedish pig production, the animal-based indicators that are included need to be assessed. This study only examined the animal-based indicators assessed on sows and gilts (around seven months old) within the project “Ask the Pig”. The aim of the study is to quantify and describe the variation of animal-based welfare indicators in Swedish pig production.
The study's research questions are:
Are there variation in pig welfare indicators for sows in Swedish pig farms, relevant for benchmarking?
Are there associations between different pig welfare indicators for sows?

2. Material and method

2.1 Data collection

Data was collected from welfare assessments conducted at 27 commercial pig farms across Sweden between July 2022 and September 2023. This accounts for approximately 10% of piglet producing farms[1]. The farms were categorized as medium to large in their herd size, with between 106 and 1300 sows in production (hereafter referred to as SIP). Of the participating farms, 25 of 27 were integrated, including the whole piglet production chain (e.g. mating, gestation and farrowing). Of the participating farms 2 of 27 were not integrated. One of these farms had only sows during the period from mating and gestation (in Swedish called “suggnav” in a “suggring”), whilst the other farm had sows during the period from farrowing to weaning (in Swedish called “satellit” in a “suggring”). “Suggring” is a production system in Sweden, where different farms specialise in different parts of the piglet production cycle. Six herd veterinarians from Gård & Djurhälsan visited the pig farms (one veterinarian per farm visit) to conduct welfare assessments based on the protocols developed in the project "Ask the Pig”. Before the assessments were conducted on the farm, a training day was organized for the participating veterinarians to discuss the assessments jointly. During the training day, which took place partly on a farm, the veterinarians practiced assessments. For animal-based indicators, such as stereotypical behaviors, the veterinarians watched videos showing various stereotypical behaviors typical of pigs. The assessors (in this case, the veterinarians) were specialists in pigs with extensive knowledge of their field. The purpose of the meeting was to calibrate the veterinarians in their assessments in order to reduce the risk of assessing the indicators differently. Different protocols were created for each unit (farrowing, mating, gestation) to be tailored to the current production stage and animal category. The animal-based welfare indicators were chosen because they have been validated in previous studies (e.g. Welfare quality), as well as to be adapted to the current production stage. The indicators assessed in different types of units were chosen in the unit type where it was feasible to assess them. For example, it was not feasible to assess overgrown hooves at individual level in group-housed systems, and therefore, the assessment was conducted in farrowing pens where the sow is kept alone in a pen. This thesis study includes assessments of sow welfare indicators (including gilts around seven months old) from the farrowing, mating, and gestation units in each farm. For the farrowing units, assessments of the piglets were included. Herinafter, gilts around seven months old are included when referring to sows.

[1] Rebecka Westin, veterinär, Gård & Djurhälsan, mejl 2025-02-28

2.1.1 Farrowing unit

The assessments were conducted in farrowing units with lactating sows, but only in the units where the majority of sows had already farrowed. Units where the sows had not yet farrowed were not visited. In farms with over 100 SIP, 20 sows were assessed individually, and in farms with fewer than 100 SIP, 10 sows were assessed individually. The pens (sows) assessed were distributed evenly across the unit. The number of pens in the unit was divided by the number of animals to be assessed in order to reach a total of 20 sows (at over 100 SIP). For example, if 20 sows were to be assessed in two farrowing units, 10 sows were assessed per unit. If there were 30 pens in each unit, the sow was assessed in every third pen. Animal-based indicators assessed in farrowing units were if sows were too thin, if piglets were lying in a pile, if sows were in need of euthanasia, if sows performed stereotypical behavior, if sows had overgrown hooves, if sows were dirty, if sows had pressure sores on carpus or on the hock, and if sows had abrasions above the hoof. The assessments were divided at both unit- and individual level (Table 1.)

2.1.2 Mating unit

The assessments were conducted on the group of sows that had been weaned most recently. In order for a group to be assessed, no more than two weeks should have passed since weaning, which the assessments had to be planned after. In farms with over 100 SIP, 20 individuals were assessed, and in farms with fewer than 100 SIP, 10 sows were assessed. If the sows were housed in different types of pens or units, the assessments were carried out in all types of housing, with a maximum of four (>100 SIP) or two (<100 SIP) types of units/pens, meaning at least five sows per group. If the number of sows in the pen was seven or fewer, all sows in the pen were assessed. Examples of different pen types include pens with deep litter beds, pens with separate areas for eating, resting, and defecating (known as three-room pens), as well as pens with combined eating and lying areas. The general pen types can further be designed and modified in various ways (Svendsen & Svendsen, 1997). The assessment was to be distributed so that at least five first-time farrowers were included for over 100 SIP, and three for under 100 SIP. Animal-based indicators assessed in mating units were if sows were too thin, if sows were in need of euthanasia, if stereotypical behavior occurred, if sows were not lying in the intended lying area, if sows were dirty or if sows were lame. The assessments were divided at pen- and individual level (Table 1.)

2.1.3 Gestation unit

The assessment was conducted in units/pens with animals that had been pregnant for at least one month. In farms with over 100 SIP, individual assessments were performed on 20 sows, while for farms with fewer than 100 SIP, individual

assessments were conducted on 10 sows. If the sows were housed in different types of pens or units, assessments were carried out in all types, with a maximum of four (>100 SIP) or two (<100 SIP) types of units/pens, meaning at least five sows per group. If the number of sows in the pen was seven or fewer, all sows in the pen were assessed. If there were several units, sows in differens stages of lactation were assessed.The assessment was to be distributed so that at least five pregnant gilts were included when over 100 SIP and three when under 100 SIP. Animal-based indicators assessed in gestation units were if sows were too thin, if sows were in need of euthanasia, if stereotypical behavior occurred, if sows were not lying in the intended lying area, if sows were dirty or if sows were lame. The assessments were divided at pen- and individual level (Table 1.)

2.1.4 Assessment of animal-based indicators

Table 1. Animal-based indicators included in "Ask the pig" welfare protocol, what they indicate and how assessment were carried out during farm visits.

	What the assessment indicate and consequences it may cause the animal	**Production unit where assessment was conducted**	**Assessment method**	**Registration (unit)**
Animal-based indicator assessed at unit level				
Thin sows	-Insufficient intake of nutrition →Causes hunger which can lead to suffering →Causes a disease-like state →Suppression of immune system →Increased risk of developing stereotypical behaviors →Causes frustration and aggression (Welfare Quality, n.d.)	Farrowing unit	-Observations were made regardless of the stage of lactation the sow was in -All the animals in the unit were inspected - Too thin: The pelvis, ribs, and spine are clearly visible; from the back, the spine appears pointed	Number of sows that are too thin
Piglets lying in a pile	-Lack of thermal comfort →Causes the piglets to freeze →Increased risk of hypothermia which can lead to death (Welfare Quality, n.d.)	Farrowing unit	-Observations were made on the first 10 litters in the unit that were inactive at the observation occasion -Observations were made to see if the piglets were lying in a pile -If ≥50% of piglets were laying together it was considerd forming a pile -Observations were made to see where the majority of the piglets was located in the pen	Number of pens in each unit where piglets laying in a pile
Sows in urgent need of euthanasia	-Deficient supervision -Lack of treatment →Causes prolonged and unnecessary pain and suffering (Swedish Board of Agriculture, 2024c)	Farrowing unit	The need for euthanasia was noted only if the animal was assessed to be beyond saving (e.g., despite treatment)	Number of sows in need of urgent euthanasia+ reason commented

Occurrence of stereotypical behaviors	-Insufficient nutrition -Restricted possibilities to perform natural behavior →Causes stress, frustration, apathy and suffering (Welfare Quality, n.d.)	Farrowing unit	-Listening for stereotypies such as teeth grinding and biting on objects followed by ocular observation of sterotypies -Play with furnishings was not counted as a stereotypy -The veterinarians were shown videos beforehand where pigs displayed stereotypical behaviors	Number of sows that perfomed stereotypic behavior + type of stereotypy
Animal-based indicator assessed at pen level				
Occurrence of stereotypical behaviors	-Insufficient nutrition -Restricted possibilities to perform natural behavior →Causes stress, frustration, apathy and suffering (Welfare Quality, n.d.)	Mating unit Gestation unit	-Listening for stereotypies such as teeth grinding and biting on objects followed by ocular observation of sterotypies -Play with furnishings was not counted as a stereotypy -The veterinarians were shown videos beforehand where pigs displayed stereotypical behaviors	Number of sows that perfomed stereotypic behavior + type of stereotypy
Thin sows	-Insufficient intake of nutrition →Causes hunger which can lead to suffering →Causes a disease-like state →Suppression of immune system →Increased risk of developing stereotypical behaviors →Causes aggression (Welfare Quality, n.d.)	Mating unit Gestation unit	-Observations were made regardless of the stage of pregnancy the sow was in (mating unit) -Observations were made regardless of the stage of lactation the sow was in (gestation unit) -All the animals in the unit were inspected - Too thin: The pelvis, ribs, and spine are clearly visible; from the back, the spine appears pointed	Number of sows that are too thin
Sows in urgent need of euthanasia	-Deficient supervision -Lack of treatment →Causes prolonged and unnecessary pain and suffering (Swedish Board of Agriculture, 2024c)	Mating unit Gestation unit	The need for euthanasia was noted only if the animal was assessed to be beyond saving (e.g., despite treatment)	Number of sows in need of urgent euthanasia+ reason commented

Sows lying on surfaces not intended for the purpose	-Lack of thermal comfort -Substandard design of animal housing facilities -High stocking density →Leads to dirty sows which causes higher risk of disease transmission (Swedish Board of Agriculture, 2024c)	Mating unit Gestation unit	-Sows lying on surfaces not intended for the purpose were observed (e.g., feeding stalls and slatted floors) -Exceptions were made for feeding pens and environmental slats -Lying behaviors in sows were assessed in the same pens where individual assessments are conducted, but all sows in the pen were evaluated regarding lying behavior before individual assessments were made, where the sows may be disturbed --If ≥50% of the sow's body was in a place that was not intended for the purpose, the sow was assessed to be lying in the wrong designated area	Number of sows not laying on surfaces intended for the purpose
Animal-based indicator assessed at individual level				
Overgrown hooves	-Deficient supervision -Insufficient hoof care -Soft flooring →Causes problems with walking, pain, and can further cause lameness and other problems (Swedish Board of Agriculture, 2024c)	Farrowing unit	-Observations were made of all four hooves on the sow -Overgrown hooves: The load is shifted to the hoof region and the angle is broken	0:No 1:Yes
Cleanliness	-Substandard design of animal housing facilities -Insufficient bedding material -Deficient manure management -High stocking density →Causes higher risk of disease transmission (Swedish Board of Agriculture, 2024c)	Farrowing unit Mating unit Gestation unit	-Assessed based on three ratings (0-2) of cleanliness -The assessment was performed on one side of the animal -The side that the animal displayed was assessed	0: less than 20% of the body was covered in dirt 1: 20-50% of the body was covered in dirt 2: more than 50% of the body was covered in dirt

Pressure sores on carpus	-Substandard design or upkeep of animal housing facilities -Poor flooring → Increased risk of becoming lame → Increased risk of getting infection →Causes pain and suffering (Welfare Quality, n.d.)	Farrowing unit	-The assessment was performed on one side of the animal -Assessed based on two classifications (0-1)	0: swelling in an area less than 5 cm 1: swelling in an area greater than 5 cm, or a wound (regardless of size) that goes through the skin
Pressure sores on hock	-Substandard design or upkeep of animal housing facilities -Poor flooring → Increased risk of becoming lame → Increased risk of getting infection →Causes pain and suffering (Welfare Quality, n.d.)	Farrowing unit	-The assessment was performed on one side of the animal -The side that the animal displayed was assessed -Assessed based on two classifications (0-1)	0: swelling in an area less than 5 cm 1: swelling in an area greater than 5 cm, or a wound (regardless of size) that goes through the skin
Abrasions above the hoof	-Substandard design or upkeep of animal housing facilities -Poor flooring → Increased risk of becoming lame → Increased risk of getting infection →Causes pain and suffering (Welfare Quality, n.d.)	Farrowing unit	-Observation was conducted on one side of the animal -The side that the animal displayed was assessed -Assessed based on two classifications (0-1)	0: No abrasions exist that go through the skin 1: Abrasions exist that go through the skin
Lameness	-Substandard design or upkeep of animal housing facilities -Poor flooring →Causes pain and suffering →Can cause problems with walking and eating (Welfare Quality, n.d.)	Gestation unit Mating unit	-Assessed based on three classifications (0-2) -Sows where activated in order to assess their gait	0: The sow is assessed to have a normal gait or moderate lameness, and uses all four legs 1: The sow is assessed to have severe lameness and puts minimal weight on the injured leg 2: The sow is assessed to be non-weight-bearing and does not support the injured leg or is lying down

2.2 Statistical analysis

Data from the veterinarians' assessments were entered into Microsoft Office Excel 2016 and transferred to the statistical software MiniTab version 21. For the descriptive analysis, data was summarised into proportion of sows, pens or units where each indicator occurred or not (e.g binary values). This was partly done to harmonize the observations, as some observers only recorded whether the indicator was present or not, while others assessed the indicator on an ordinal scale (e.g., 0-2). Another reason was that the study's purpose was not to quantify the prevalence at the individual level, but rather to determine overall whether the indicator was present or not. Variation is described in barcharts, means and standard deviations.

Associations between different animal welfare indicators, both within and across production unit types, were assessed using cluster analysis. Cluster analysis is based on correlations between multiple continuous numeric variables with good opportunities for visualisation of results through e.g., dendrogram.

3. Results

3.1 Farrowing unit

Assessments carried out in farrowing units were recorded at 26 of 27 participating farms, as one farm did not have sows in the unit during the farrowing period (a so-called “satellit”-farm).

3.1.1 Animal-based indicators assessed at individual level

Overgrown hooves were observed in sows in the farrowing unit in 14 of 26 farms. The highest proportion of observed sows with overgrown hooves was 25.0%, which was observed on two of the farms (Figure 1). The mean proportion of sows with overgrown hooves was 6.5% per farm, with a standard deviation of ± 8.10%.

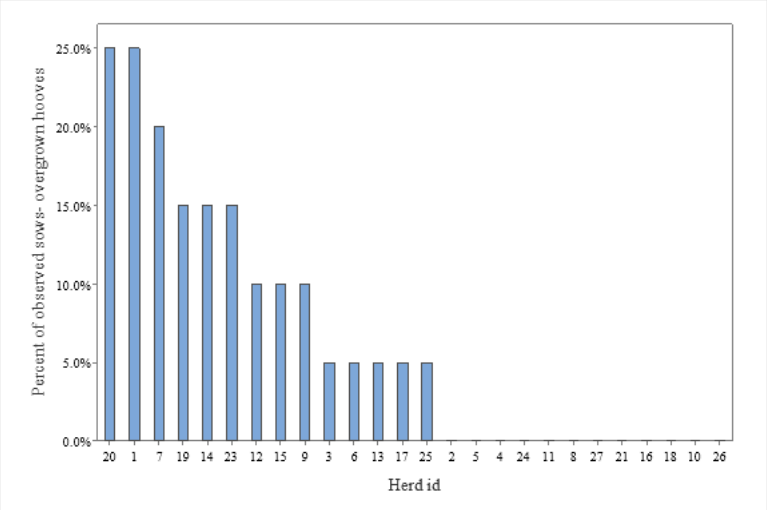

Figure 1. Percent of observed sows in farrowing units that had overgrown hooves for each farm (n=26).

Sows in the farrowing unit with pressure sores on carpus were observed in 25 of 26 farms. The highest proportion of observed sows with pressure sores on carpus was 75.0%, which was assessed on one of the farms (Figure 2). The mean proportion of sows with pressure sores on carpus was 29.8% per farm, with a standard deviation of ± 20.37%.

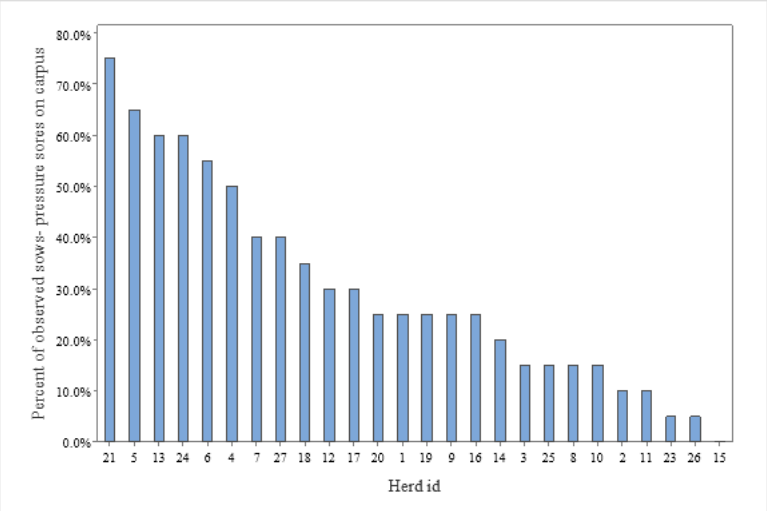

Figure 2. Percent of observed sows in farrowing units that had pressure sores on carpus for each farm (n=26).

Sows in the farrowing unit with pressure sores on the hock were observed in 7 of 26 farms. The highest proportion of observed sows with pressure sores on the hock was 10.0%, which was assessed on three of the farms (Figure 3). The mean proportion of sows with pressure sores on the hock was 1.9% per farm, with a standard deviation of ± 3.49%.

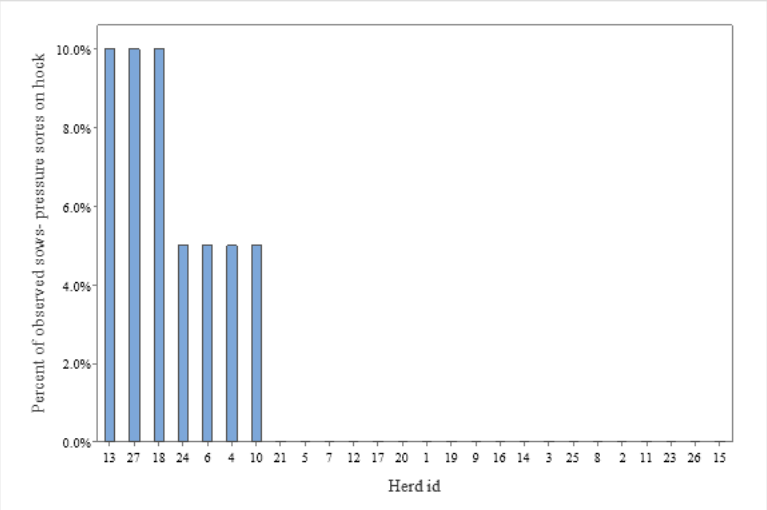

Figure 3. Percent of observed sows in farrowing units that had pressure sores on hock for each farm (n=26).

Sows in the farrowing unit with abrasions above the hoof were observed in 16 of 26 farms. The highest proportion of observed sows with abrasions above the hoof was 30.0%, which was assessed on one of the farms (Figure 4). The mean proportion of sows with abrasions above the hoof was 7.3% per farm, with a standard deviation of ± 8.03%.

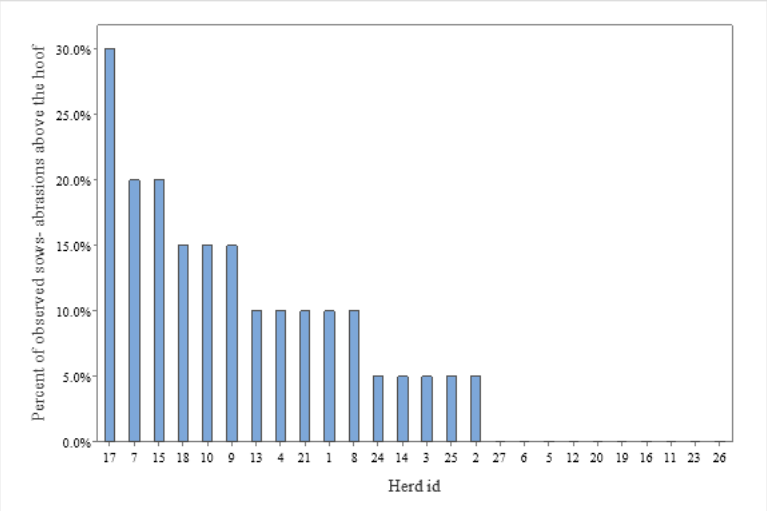

Figure 4. Percent of observed sows in farrowing units that had abrasions above the hoof for each farm (n=26).

Sows in the farrowing unit that were dirty were observed in 25 of 26 farms. The highest proportion of observed sows that were dirty was 70.0%, which was assessed on two of the farms (Figure 5). The mean proportion of sows that were dirty was 30.8% per farm, with a standard deviation of ± 18.69%.

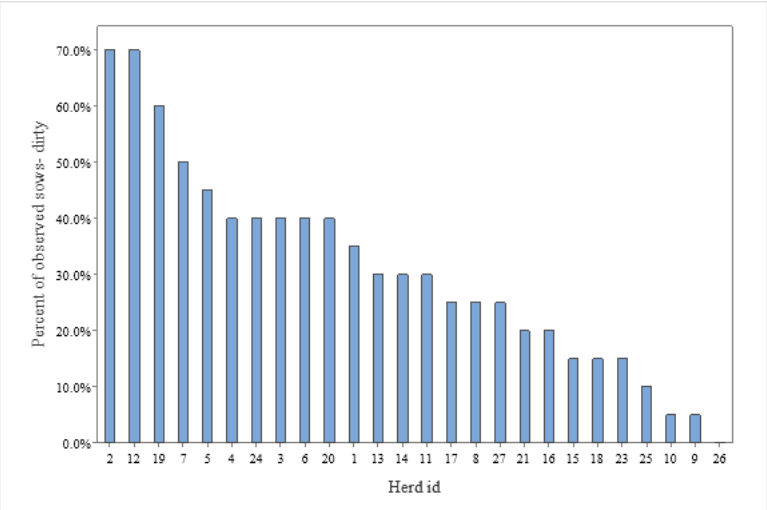

Figure 5. Percent of observed sows in farrowing units that were dirty for each farm (n=26).

3.1.2 Animal-based indicators assessed at unit level

At the 26 participating farms, assessments were conducted on a total of 55 farrowing units. Stereotypical behavior was observed at least once in 7 out of 55 units. The mean proportion of units were sows performed a stereotypical behavior was 12.7% per unit, with a standard deviation of ± 33.63%.

Veterinarians did not record any sows being in urgent need of euthanasia in any of the 55 farrowing units.

Sows that were too thin were observed at least once in 3 out of 55 farrowing units. The mean proportion of units with sows that were too thin was 5.5% per unit, with a standard deviation of ± 22.92%.

Piglets lying in piles was observed at least once in 13 out of 55 farrowing units. The mean proportion of units where piglets were lying in a pile was 23.6% per unit, with a standard deviation of ± 42.88%.

3.2 Gestation unit

Assessments carried out in gestation units were recorded at 26 of 27 participating farms, as one farm did not have sows in the unit during the gestation period (a so-called “suggnav”).

3.2.1 Animal-based indicators assessed at individual level

Sows in the gestation unit that were dirty were observed in 21 of 26 farms. The highest proportion of observed sows that were dirty was 75.0%, which was assessed on one of the farms (Figure 6). The mean proportion of sows that were dirty was 25.2% per farm, with a standard deviation of ± 21.28%.

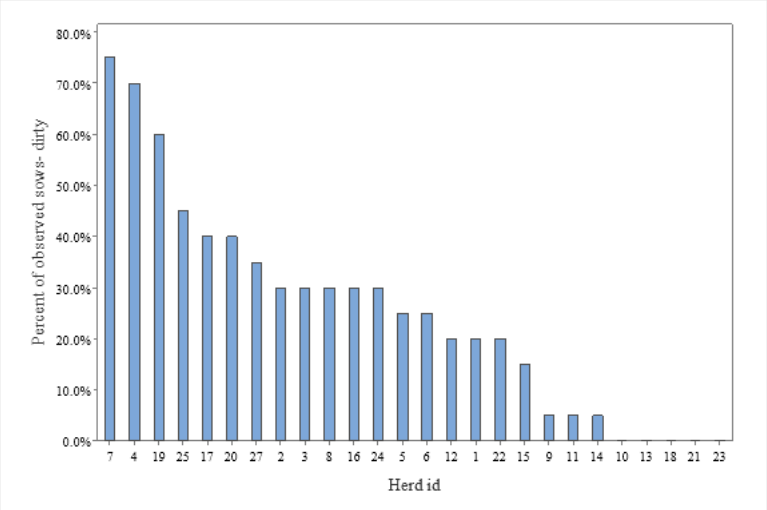

Figure 6. Percent of observed sows in gestation units that were dirty for each farm (n=26).

Sows in the geastion unit with lameness were observed in 4 of 26 farms. The highest proportion of observed sows with lameness was 15.0%, which was assessed on one of the farms (Figure 7). The mean proportion of sows with lameness was 1.4% per farm, with a standard deviation of ± 3.62%.

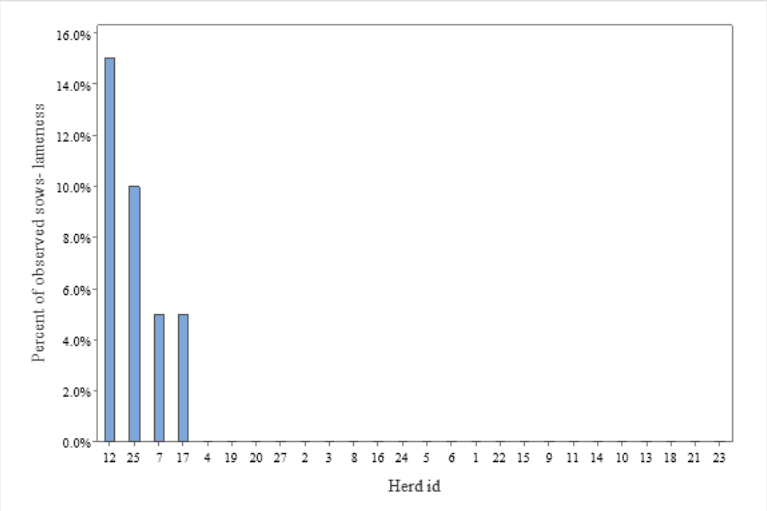

Figure 7. Percent of observed sows in gestation units with lameness for each farm (n=26).

3.2.2 Animal-based indicators assessed at pen level

At the 26 participating farms, assessments were conducted on a total of 92 gestation pens. Stereotypical behavior was observed at least once in 14 out of 92 pens. The mean proportion of pens were sows performed a stereotypical behavior was 15.2% per pen, with a standard deviation of ± 36.12%.

Sows in urgent need of euthanasia were observed at least once in 3 out of 92 gestation pens. The mean proportion of pens where sows were in need of urgent euthanasia was 3.3% per pen, with a standard deviation of ± 17.86%.

Sows that were too thin were observed at least once in 2 out of 92 gestation pens. The mean proportion of pens with sows that were too thin was 2.2% per pen, with a standard deviation of ± 14.66%.

Sows not lying on the intended area were observed at least once in 54 out of 92 gestation pens. The mean proportion of pens where sows were not lying in the intended area was 58.7% per pen, with a standard deviation of ± 49.51%.

3.3 Mating unit

Assessments carried out in mating units were recorded at 25 of 27 participating farms. One of the farms did not have sows in the unit during the mating period (a so-called “satellit”-farm), and on one farm the assessment was not carried out due to time limitations at the visit.

3.3.1 Animal-based indicators assessed at individual level

Sows in the mating unit that were dirty were observed in 23 of 25 farms. The highest proportion of observed sows that were dirty was 90.0%, which was assessed on two of the farms (Figure 8). The mean proportion of sows that were dirty was 36.0% per farm, with a standard deviation of ± 25.08%.

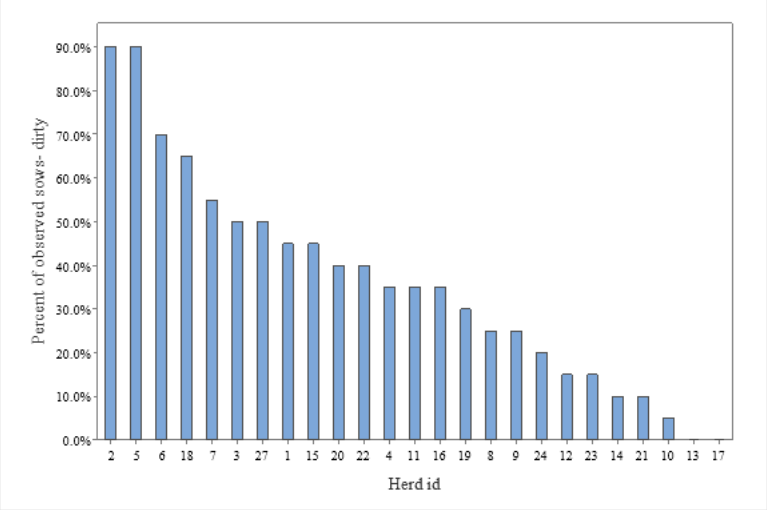

Figure 8. Percent of observed sows in mating units that were dirty for each farm (n=25).

Sows in the mating unit with lameness were observed on 2 of 25 farms. The highest proportion of observed sows with lameness was 5.0%, which was assessed on two of the farms. The mean proportion of sows with lameness was 0.4% per farm, with a standard deviation of ± 1.38%.

3.3.2 Animal-based indicators assessed at pen level

At the 25 participating farms, assessments were conducted on a total of 62 mating pens. Stereotypical behavior was observed at least once in 7 out of 62 pens. The mean proportion of pens were sows performed a stereotypical behavior was 11.3% per pen, with a standard deviation of ± 31.91%.

Sows in urgent need of euthanasia were observed at least once in 2 out of 62 mating pens. The mean proportion of pens where sows were in need of urgent euthanasia was 3.2% per pen, with a standard deviation of ± 17.81%.

Sows that were too thin were observed at least once in 7 out of 62 mating pens. The mean proportion of pens with sows that were too thin was 11.3% per pen, with a standard deviation of ± 31.91%.

Sows not lying on the intended area were observed at least once in 29 out of 62 mating pens. The mean proportion of pens where sows were not lying on the intended area was 46.8% per pen, with a standard deviation of ± 50.3%.

3.4 Association between the animal welfare indicators

The cluster analysis conducted is based on multivariate correlations. High similarity between indicators indicates positive correlations, which means that if one indicator is present, the other is also likely to be present. Correspondingly, it may also mean that if the occurrence of one indicator is low, the occurrence of the other indicator is also low. However, the correlation does not imply that one indicator occurs as a result or consequence of the other indicator's occurrence, but there are other underlying causes at play that affect both indicators.

There was an association between the occurrence of dirty sows in all three unit types. The occurrence of dirty sows in the gestation unit and the occurrence of dirty sows in the farrowing unit were particularly associated (Figure 9). The results indicate that on farms where sows are dirty, this is prevalent in all three units.

In farrowing units, the results show association between the occurrence of pressure sores on the carpus and pressure sores on the hock (Figure 9). The results indicate that on farms where sows had occurrence of pressure sores on the carpus in the farrowing unit, sows with pressure sores on the hock were also likely to be present.

On farms where sows were lame in the mating unit, there were also lame sows in the gestation unit (Figure 9).

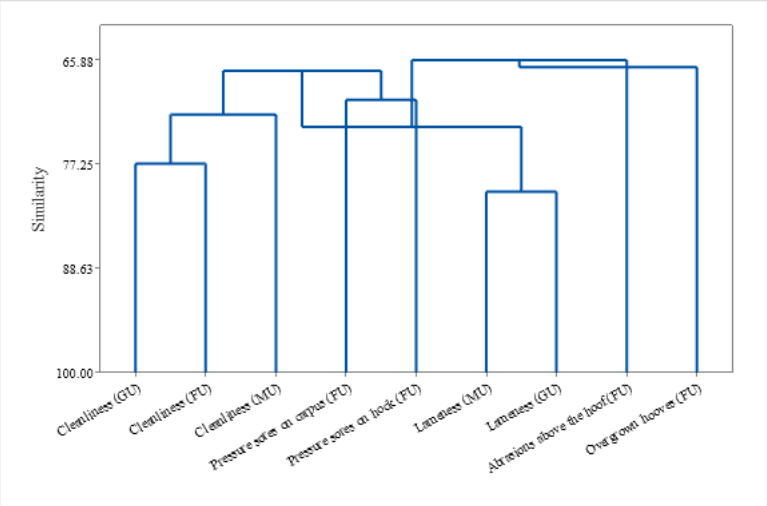

Figure 9. Dendrogram showing how the occurrence of the indicators assessed at the sows level in the gestation unit (GU), farrowing unit (FU), and mating unit (MU) associates to each other.

4. Discussion

This study aimed to quantify and describe the variation of animal-based welfare indicators relevant to Swedish pig production. The result showed that almost all indicators included in the study were observed at least once during assessments on the farm, except for sows that were in urgent need of euthanasia. The results also show that associations between indicators are present and of potential practical relevance.

4.1 Cleanliness (e.g. dirty sows)

The indicator with the highest prevalence in proportion of sows with deviations between farms was "cleanliness (e.g. dirty sows)", which was observed among sows in all unit types and in the majority of the farms included in the study. The highest proportion of dirty sows was observed in mating units, where in seven of the farms more than 50% of the sows were assessed as dirty. In gestation units, three farms had sows where more than 50% of them were assessed as dirty. In farrowing units, four farms had sows where more or equal to 50% of them were assessed as dirty. There was also a correlation between the presence of dirty sows in all types of units.

In wild environments as well as in environments where domesticated pigs are allowed, pigs wallow by covering parts of their bodies with mud. This behavior is natural for the species and is performed for purposes like thermoregulation, as for some protection against parasites/insects (Bracke, 2011). In such environments, certain dirt (e.g. mud) can therefore contribute to the animal's positive welfare. In indoor keeping of pigs however, it may indicate that other problems exist in the pigs' environment. If there are dirty sows, it may indicate that the design of the building and pens are not optimal, that manure removal is insufficient, that lying areas are not optimal, that temperature is too high, or that there is overcrowding in the pen. There is also an association between sows being lame and being dirty, as lame sows tend to lie down more, which makes them dirtier. This association was demonstrated in a study by Zurbrigg & Blackwell (2006), where the farms with the highest incidence of dirty sows were the same farms where the proportion of lame sows was highest. However, a similar association was not clear in the cluster analysis of this study. Pigs are inherently clean animals and, when given the choice, prefer to urinate and defecate in a separate area of the pen. If pigs are dirty, it can indicate that they have had to lie down on a surface that is not intended for resting. In addition to the previously mentioned reasons, temperature can also play a role. If the temperature is too high, pigs tend to want to cool themselves by lying down in a cool place (e.g. on slatted floors). Furthermore,

dirty pigs pose an increased risk of disease transmission, which can further negatively impact welfare (Courboulay, 2007). The size of sows increases with each parity, with the increase flattening out around the sow's sixth litter (Backeman Hannius *et al.*, 2024). The increase in the sow's size, combined with the fact that the size of the pens remains the same, can mean that some sows are housed in a space that is not suited to their size (Backeman Hannius *et al.*, 2024). A pen that is too small in relation to the sow's size can make it difficult for the sow to use the pen as intended (e.g., for defecating, eating, lying down), which can lead to the sow becoming dirty.

4.2 Overgrown hooves

For the indicator “overgrown hooves”, assessed in the farrowing units, there was a high prevalence, with deviations between farms. The proportion of sows with overgrown hooves in farrowing units was relatively low (≤25%).

Pigs that are kept on straw bedding can get overgrown hooves, as there is no natural wear on the soft surface. If the hooves are neither trimmed nor naturally worn down, they can become overgrown, which over time can lead to an increased risk of hoof injuries, improper weight distribution, and lameness. Injuries to the hooves and lameness can cause suffering for the animal (Gård & Djurhälsan, 2021).

4.3 Pressure sores on carpus and on hock

For the indicator “pressure sore on carpus”, assessed in the farrowing units, there was a relatively high prevalence, with deviations between farms. In six of the farms, more than 50% of the sows had pressure sores on carpus. In contrast, for the indicator “pressure sores on hock”, assessed in the farrowing units, there was almost no differences between farms. In farms where the indicator occurred, the proportion of sows with pressure sores on the hock was low (≤10%).

The literature on the subject that can be applied to Swedish conditions are limited. Much of the literature in this area deals with body lesions or pressure sores on shoulders that are related to confinement of sows, or body lesions that arise due to aggression in group-housed systems. However, it is assumed that some of the causes behind body lesions and pressure sores on sows shoulders (e.g., poor flooring, sows weight, leg strength, lying behavior, lying comfort) may also contribute to pressure sores on carpus and hock in group-housed loose systems (Bonde *et al.*, 2004). Due to the high body weight of the sow, the body is subjected to high pressure if no relief (e.g., bedding material) is provided (Kilbride *et al.*, 2009).

4.4 Abrasions above the hoof

For the indicator “abrasions above the hoof”, assessed in the farrowing units, there was a relatively high prevalence, with deviations between farms. The proportion of sows with abrasions above the hoof was relatively low (≤30%).

The literature on the subject is limited, but the causes behind sows getting abrasions are assumed to be poor flooring conditions such as hard material or slatted flooring in the pen that can cause injury (Gjen & Larssen, 1995).

4.5 Lameness

For the indicator "lameness", assessed in gestation- and mating units, there was a low prevalence, with deviations between farms. The proportion of sows with lameness in gestation units was ≤15%, and in mating units ≤5%.

Sows may sustain injuries that lead to lameness for several different reasons. Lameness is a welfare issue as it may indicate that the sow is in pain and discomfort. Velarde (2007) explains that lameness is a symptom of an abnormality that causes the animal to experience too much pain to walk normally. Injuries can occur due to poor flooring conditions (e.g., dirty, hard material, or overly soft material) or poor pen design (risk of injury), which can lead to the animal becoming lame. Housing on deep bedding may lead to overgrown hooves, making it difficult for the animal to walk normally, which can further lead to lameness unless the hooves are trimmed. Gjein & Larssen (1995) showed that there was a higher proportion of lame sows in farms where the sows were kept on partially slatted flooring made of concrete, compared to partially slatted flooring made of plastic. The same authors concluded that this was due to the concrete being a harder material, which places greater stress on the hooves. Poor pen hygiene increases the likelihood of lameness in animals because there is a higher risk of wounds becoming infected. When sows are mixed, aggression and fighting can occur as the pigs establish a new hierarchy or assert their rank. During these fights, the pigs can get injured, which can result in lameness (Gjein & Larssen, 1995). Other underlying causes of lameness in sows may include various types of infections or genetically inherited traits such as weak legs (Velarde, 2007). Age also plays a role in the presence of lameness, where older sows tend to have more problems related to legs/claws compared to younger sows. Lame sows tend to lie down more, which can cause problems with skin lesions if the animal is lying on a hard floor. In more severe cases of lameness, it can make it difficult for the sow to reach water and feed, which can lead to hunger and thirst, and in the long term thin sows (Heinonen *et al.*, 2013). The same authors explain that it is more difficult for lame sows to assert themselves against other sows in order to access

feed and water sources when needed, which further can result in insufficient intake of feed and water.

4.6 Stereotypical behaviour

For the indicator "stereotypic behavior" carried out in all unit types, there was a relatively low prevalence, with deviations between units and pens. In 7 out of 55 farrowing units assessed, sows were observed at least once performing a stereotypical behavior. The 7 units where stereotypical behavior were registered at least once, were at 7 out of the 26 farms visited. In 14 out of 92 gestation pens assessed, sows were observed at least once performing a stereotypical behavior. The 14 pens where stereotypical behavior were registered (at least once), were at 9 out of the 26 farms visited. In 7 out of 62 mating pens assessed, sows were observed at least once performing a stereotypical behavior. The 7 pens where stereotypical behavior were registered (at least once), were at 6 out of the 25 farms visited.

Stereotypic behaviors are repetitive movements or actions performed without serving a function for the animal. These stereotypic behaviors also lack a clear goal, but may be carried out by the animal in an attempt to cope with its environment. The development of stereotypic behaviors in pigs can be attributed to multiple factors, such as insufficient fulfillment of nutritional needs (such as inadequate intake of fiber/protein) and unmet needs for performing strongly motivated behaviors (such as nesting behavior in sows) (Li & Gu, 2024). According to the same authors, sows are fed more restrictively during gestation, which can lead to increased hunger and frustration. The same authors suggest that pregnant sows are therefore more likely to develop the stereotypic behavior of sham-chewing, which involves the sow performing chewing movements. In this study, the proportion of sows where stereotypic behaviors were observed at least once was highest in gestation units. The results align with Li & Gu (2024), but it cannot be concluded that this is due to restrictive feeding. Although stereotypic behavior may help the individual cope with their environment and thus provide a self-stimulating effect, the behaviors have developed as a result of the animal's negative emotional state. Stereotypic behaviors can continue to be performed by the animal even after the triggering cause behind the behavior has been addressed (Hemsworth, 2018). In some cases, this makes it difficult to determine whether the performance of the stereotype is due to an ongoing problem. Nevertheless, stereotypic behavior is a welfare issue and should not occur at all, as it indicates that the animal's welfare has been or is compromised.

4.7 Thin sows

For the indicator "thin sows" carried out in gestation- and mating units, there was a low prevalence, with deviations between units and pens. However, the indicator was observed at least once in all types of units (farrowing, mating, gestation), with the highest mean proportion assessed in mating units. In 3 out of 55 farrowing units assessed, a sow being too thin was observed at least once. The 3 units where a sow being too thin were registered (at least once), were at 3 out of the 26 farms visited. In 2 out of 92 gestation pens assessed, a sow being too thin was observed at least once. The 2 pens where a sow being too thin were registered (at least once), were at 2 out of the 26 farms visited. In 7 out of 62 mating pens assessed, a sow being too thin was observed at least once. The 7 pens where a sow being too thin were registered (at least once), were at 6 out of the 25 farms visited.

It is not surprising that the highest mean proportion was found in mating units, as the sows have recently weaned their piglets, during which they expended a lot of energy nursing them. However, before farrowing, the producers should ensure that the sow has a sufficient body condition so that the sow can use stored energy reserves while nursing. Sows get too thin due to insufficient intake of feed which can be affected by various reasons, e.g. stage in production cycle, competition for feed and lameness. Given today's high-prolific sows, it is crucial from a welfare perspective to provide them with the resources they need to stay in good body condition (Maes *et al.,* 2004).

During a sow's time in production, pregnancy consumes much time, making proper feeding and nutrition crucial for her productivity and longevity. Good nutrition promotes health and maintains optimal body condition, which influences reproductive ability and reduces culling risk (Monteiro *et al.,* 2025). During gestation, maintaining good body condition supports fetal development and prepares the sow for farrowing and nursing (Monteiro *et al.,* 2025). In this section, this master thesis only highlights the negative effects of being too thin during pregnancy and farrowing, but there are also risks with sows being overweight. Adequate body condition allows the sow to draw on energy reserves for nursing. Restrictive feeding early in gestation can reduce embryo survival (Monteiro *et al.,* 2025). Muro *et al.,* (2023) states that restrictive feeding is often applied during the gestation period to prevent sows from becoming overweight. According to Maes *et al.,* (2004), a small error in the sows' feed formulations can have a significant impact on the sow's body condition. Furthermore, the same authors note that it may take time before the consequences of underfeeding are visible. Thin sows (with backfat thickness below 15 mm) are at an increased risk of giving birth to fewer live piglets, increased stillbirths, lower piglet weights, and piglets that are at risk of poorer growth. Studies have shown that piglets from a sow that has been

underweight during gestation have poorer development and productivity throughout their lives (Muro *et al.,* 2023).

Compared to the gestation period, the sow spends less time in the farrowing and nursing unit. Larger litters have extended farrowing durations, with over five hours negatively affecting piglet survival, reproductive performance, nursing, and sow health (Monteiro *et al.,* 2025). Modern high-prolific sows require much energy for farrowing and nursing. Excessive weight loss during this period may indicate poor pre-farrowing body condition or inadequate nutrition (Monteiro *et al.,* 2025). The sow's weight can negatively impact milk production by reducing both milk quantity and its energy and fat content, potentially limiting the milk's ability to meet piglet needs (Muro *et al.,* 2023). Underfeeding may also decrease colostrum production and antibody levels, especially IgA, raising disease risk and harming piglet welfare (Muro *et al.,* 2023). Insufficient colostrum intake can lead to lower weaning weights, affecting overall production (Muro *et al.,* 2023). If the sow loses too much weight during the farrowing period, she may have difficulty coming into heat again soon after weaning (Thaker & Bilkei, 2005). Muro *et al.,* (2023) emphasize that all stages of the sow's reproductive cycle influence one another. Therefore, greater deviations (e.g., the sow's weight) in one step of the cycle can affect subsequent steps.

If sows are very thin, it can be assumed that they are experiencing hunger, which indicates discomfort and suffering (Phillips, 2016). If nothing is done to improve the animal's body condition, the risk increases that undernourished animals will become ill or exhibit disease-like symptoms, which also causes suffering (Phillips, 2016). As mentioned earlier, deficiencies in various nutritional substances such as fiber and protein can lead to the animal developing stereotypical behavior (Li & Gu, 2024). There is also an association between sows that are very lame and those that are thin, due to movement difficulties making it hard for the animal to reach feed and water (Heinonen *et al.,* 2013). If there is limited access to food, aggression and fear may also arise during feeding (Phillips, 2016). Depending on the feeding system, sows that are higher in rank may eat more feed than sows that are subordinate, which can cause sows that are lower in rank to become undernourished and thin (Seguin *et al.,* 2006). It can be argued that sows that have been assessed being too thin are a serious problem from an animal welfare perspective and therefore, the indicator should not occur.

4.8 Piglets lying in a pile

For the indicator "piglets lying in a pile", assessed in farrowing units, there was a relatively low prevalence, with deviations between units. In 13 out of 55 farrowing units assessed, piglet lying in piles was observed at least once. The 13

units where piglets lying in piles were registered (at least once), were at 11 out of the 26 farms visited, which is a relatively high prevalence.

At birth, piglets have difficulty regulating their body temperature and must use lying behavior or receive heat from an outside source (e.g. heat lamp or the sow), to maintain a stable temperature. Temperature is vital for the survival of piglets and should be kept stable and adjusted according to their needs. By lying close to their littermates (e.g., huddling), the total body surface area exposed to the cold is reduced. Huddling is a way for piglets to minimize heat loss through thermoregulation. Thus, it can be inferred that if piglets are lying in a pile, they are trying to reduce heat loss, indicating that the temperature is too low (Villanueva-García *et al.,* 2020). At low temperatures, piglets can suffer from hypothermia, which can cause confusion, reduced milk intake leading to starvation, and an increased risk of the sow lying on the piglet due to the piglet being too weak to escape. Overall, the consequences of hypothermia can lead to the death of the piglets (Villanueva-García *et al.,* 2020). Therefore, it is of utmost importance for the welfare of the piglets to maintain a temperature that is optimal for them.

The sow and her piglets have different temperature needs. While the sow requires a temperature of around 20℃ to avoid heat stress, the piglets require a temperature above 34℃ to stay warm and avoid hypothermia. To meet these differing needs, the pen can be adapted by placing a heated piglet corner in the pen, positioned away from the sow (Pedersen *et al.*, 2016; Larsen *et al.*, 2017). Using a heated piglet corner increases productivity by reducing the number of piglets that die from hyperthermia or related causes (Pedersen *et al.,* 2016). If piglets are lying in a pile or very closely together, even with a heated piglet corner available, their behavior may indicate that the heat source is not functioning as it should.

The type of heat source also has an impact on whether the piglets use it for its intended purpose. Larsen *et al.,* (2017) state that radiant heat is better than regular incandescent bulbs. When using incandescent bulbs, the heat is concentrated and not evenly distributed throughout the farrowing corner. This results in it being very hot for the piglets that are lying directly under the source, while it becomes cold for the piglets that are a bit further away. Larsen *et al.,* (2017) argue that using this type of heat source may lead the piglets to try to thermoregulate naturally instead (e.g. through huddling).

4.9 Urgent need of euthanasia

The indicator "urgent need of euthanasia" was not observed at all in any of the farrowing units of the farms. In gestation- and mating units, the prevalence was relatively low, with deviations between pens. In 3 out of 92 gestation pens assessed, a sow in urgent need of euthanasia was observed at least once. The 3 pens where a sow in urgent need of euthanasia were registered (at least once), were at 2 out of the 26 farms visited. In 2 out of 62 mating pens assessed, a sow in urgent need of euthanasia was observed at least once. The 2 pens where a sow in urgent need of euthanasia were registered (at least once), were at 2 out of the 25 farms visited.

In cases where sows are in urgent need of euthanasia, it can be assumed that the animal's welfare is severely impaired and that the animal is suffering. If the animal is deemed to require urgent euthanasia, its condition has deteriorated to the point where it cannot be helped. Furthermore, the presence of this indicator suggests that the individual has not received the necessary care in a timely manner, which may mean that the animal has suffered for an extended period. The occurrence of this indicator may indicate insufficient supervision of the animals or that the producer lacks adequate knowledge to manage pigs. This indicator is serious and should not occur at all, as it indicates significant deficiencies in animal welfare legislation, and therefore makes the indicator important to include in a welfare assessment (Swedish Board of Agriculture, 2024c; Animal Welfare Act (2018:1192)).

4.10 Sows not lying on intended area

For the indicator "sows not lying in the intended area" assessed in gestation- and mating units, there was a high prevalence, with deviations between pens. In 54 out of 92 gestation pens assessed, sows not lying on the intended area was observed at least once. The 54 pens where sows did not lay on the intended area were registered (at least once) at 22 out of the 26 farms visited. In 29 out of 62 mating pens assessed, sows not lying on the intended area was observed at least once. The 29 pens where sows did not lay on the intended area were registered (at least once) at 16 out of the 26 farms visited.

As previously mentioned, pigs are clean animals that when given the opportunity, differentiate between areas for manuring and areas for resting. If sows are lying in an area that is meant for manuring or eating, it may indicate that there are issues preventing the pigs from distinguishing between the different areas. This could be due to high temperatures, causing the animal to seek relief by lying on a cold surface (e.g., slatted flooring). Pigs cannot sweat and therefore need to regulate

their temperature, which they partially do through their lying behavior (Courboulay, 2007). Under commercial conditions, pigs typically do not have access to mud baths/water where they can thermoregulate through wallowing, which causes the pigs instead to lie in manure to achieve a similar cooling effect, eventhough the behaviour is not natural. Other examples of behaviors pigs perform to thermoregulate are reducing their activity and feed intake. (Olczak *et al.,* 2015). The fact that pigs do not lie in the designated area could also be due to the pen being too small, preventing all pigs from fitting on the intended surface, or making it difficult for pigs to use the pen as intended (EFSA, 2022; Ekkel *et al.,* 2003).

Welfare may be affected by an increased risk of disease and infection due to pigs lying in feces or in feeding areas, which deteriorates pen hygiene. This behavior indicates that there are problems in the environment that may compromise the welfare of the pigs.

4.11 Association between animal welfare indicators

The results indicate that there are general relationships between the occurrence of certain welfare indicators both within and across production unit types. This study did not investigate or identify the causes behind these associations. However, it would be interesting to explore this in future research.

There was an association between the occurrence of “cleanliness”, “e.g. dirty sows” in all production unit types. The result indicates that if a farm has dirty sows, it is likely a prevalent problem across all unit types. The result is not particularly surprising and may be due to similar issues underlying the occurrence of dirty sows in all units (e.g. insufficient removal of manure, overcrowding, temperature issues, poor design of the pens, or a pen that is too small in relation to the sows size). The association between the presence of the indicator across all unit types may imply that the same type of action could be beneficial in some farms. It can also imply that if the indicator is commonly found in all types of departments, it is sufficient to assess the indicator in only one of them, making the assessment more feasible.

The occurrence of pressure sores on carpus and pressure sores on the hock in the farrowing unit could be associated with each other. However, this was not the case on all farms (Figure 2 and Figure 3). The results indicate that on some farms, sows have occurrences of both pressure sores on the carpus and the hock. This may be due to sows developing pressure sores in multiple locations and not just on the carpus or hock.

The occurrence of lame sows in the mating unit could be associated with the occurrence of lame sows in the gestation unit. The results indicate that farms where sows are lame are experiencing problems in both production units. The reason behind the lameness occurring in the mating and gestation units may be that the sows are housed in similar pen designs during these periods, and that the same issues exist in both.

Finally, it needs to be considered that the observer has an influence on the outcome of the results. The same observer observed sows in all production unit types on the same farm, thus parts of the associations could be due to the observer.

4.12 Recommendations for development of a pig welfare assessment tool

In the following study, prevalence is defined as high if the indicator occurs on at least half of the farms, units, or pens. Prevalence is defined as low if the indicator occurs on fewer than half of the farms, units, or pens. Some of the animal-based indicators influence each other, where the presence of one indicator can lead to the occurrence of another. Furthermore, the literature addressed in this master's thesis has also highlighted welfare issues that can arise as a consequence of each other, eventhough these associations have not been examined in the present study. Altogheter, all animal-based indicators included in this study are relevant to include in a future welfare tool. Indicators such as the presence of thin sows, stereotypic behavior, and urgent need for euthanasia are serious deviations and should not occur at all. Despite the prevalence of these indicators being low, some of them still occurred, indicating that they are important to include in a welfare tool. By including the more serious indicators despite the low prevalence, producers can work preventively to ensure they do not occur at all. Other stakeholders can also identify and act when serious shortcomings that compromise animal welfare arise. Since it can be difficult for the producer to determine whether the presence of a stereotypical behavior is due to an ongoing problem or not, it is recommended to examine how common the indicator is. Another recommendation is to exclude potential risk factors (e.g., nutrition, restrictive feeding, restricted opportunities to perform highly motivating behaviors).

For other indicators (e.g., dirty sows, pressure sores on carpus, and sows not lying in intended areas), there was more pronounced prevalence, making it interesting to investigate what the prevalence depends on. The presence of farms with very low or no occurrence suggests that there is potential to achieve low to no occurrence of these indicators, which opens up opportunities to explore what

those farms do differently, and thereby possibly develop a "best practice". By capturing deviations in the occurrence of the examined indicators early on, producers can prevent the emergence of other indicators that could arise if the problems were allowed to persist.

As Lundmark (2016) pointed out, animal-based welfare indicators should be selected based on the criteria of validity, reliability, and feasibility. The indicators selected for this study were chosen as they had been validated in previous studies (e.g. Welfare Quality, 2009). The selection of animal-based welfare indicators included in the welfare protocols developed within the project "Ask the Pig" was largely based on those included in the Welfare Quality® project. The indicators included in the Welfare Quality® project are based on research within animal welfare and were chosen by researchers involved in the project (Welfare Quality, 2009). The associations between indicators seen in the cluster analysis in this study, where similar indicators are closer associated with each other than with other indicators, suggest reliability. The association between the occurrence of similar animal-based welfare indicators (e.g., dirty sows) indicate that veterinarians have assessed the indicators similarly, in different units at the same. The results from this study also indicate that the animal-based welfare indicators included in the study are feasible to assess under commercial settings. The assessments of the various animal-based welfare indicators were partially adapted to different unit types in order to streamline the evaluations and save time, as well as to suit units where the indicators are more commonly observed. For example, it would not have been feasible to assess overgrown hooves in gestation- and mating units, since some sows are kept on deep bedding where it is difficult to see the hooves, and since the sows are kept in groups, which would complicate the assessments. Some indicators were also intentionally excluded from this study because they were not feasible, such as shoulder ulcers in sows.

In this study, the animal-based indicators intended to be included in the animal welfare protocol have been tested. The variation has been examined to see how common the indicators are among sows on Swedish farms. The next step is to begin building a database where the results from welfare assessments are gathered and new assessments are added. Once enough data has been collected (and continues to be collected), it can be used to identify deviations between farms, as well as to work towards improvements within farms.

In the future, it would have been interesting to investigate what effect housing and management have on the occurrence of the animal-based indicators in Swedish pig production. Furthermore, this could enabled the identification of potential risk

factors behind the occurrence of animal-based welfare indicators in various production systems.

4.13 Sustainability

By developing and implementing a welfare tool in Swedish pig production aimed at continuously improving animal welfare on farm level, production will indirectly (e.g. connected to the sustainability goals, described below) and directly (at farm level) become more sustainable.

Sows pay for their place after their third litter (Engblom *et al.,* 2007), and culling before this results in less economic gain for the producer. The same authors highlight that the majority of sow culling is unplanned and occurs before the sow has had her third litter. Common reasons for culling sows identified by Engblom *et al.,* (2007) include reproductive problems, lameness with or without foot lesions, udder issues, low productivity, and traumatic injuries. In a study by Westin *et al.,* (2025), "lameness/leg problems" and "injuries" were identified as the most common reasons for unplanned culling of sows. The same study also showed that it was more common for younger sows compared to older sows, to be removed from production due to injuries. This was speculated to be due to the fact that younger sows, which are smaller and can not assert themselves as well compared to older sows, are more often injured during fights that occur when mixing groups (after weaning).

With a constant effort to improve animal welfare, it can be speculated that the animals will become healthier and therefore more productive in the future, leading to sustainable livestock. Healthy animals will also reduce unplanned culling of sows, which is important from an economic sustainability perspective. By allowing sows to remain in production longer, it can be argued that this is a more ethical way to care for sows, as it emphasizes taking good care of the animals one has instead of culling and replacing them. Treating animals well can also be argued to contribute to social sustainability for the staff. Engblom *et al.,* (2007) also argue that a high number of euthanized sows on a farm can be seen as an indicator of poor welfare. By working towards improved welfare, animal husbandry becomes more ethical, especially when animal-based welfare indicators are used to directly assess the animal's wellbeing.

If the animals are healthier as a result of ongoing efforts to improve welfare, the producer's efforts in treating sick animals will decrease. Through good practices and preventive measures, it can be argued that the producer will save time on work associated with deviations and increase their economic profit through enhanced productivity (both contributing to economic and social sustainability).

One example of the significant impact that good management can have in preventing extra work at various levels is feeding. By ensuring that a sow is fed adequately to maintain good body condition and produce a sufficient quantity of high-quality colostrum, the piglets can receive enough antibodies, which reduces piglet mortality, sick piglets, and those that do not grow sufficiently. Furthermore, the sow can return to estrus quickly, thus avoiding the risk of being culled due to reproductive problems, provided she has been well fed and not become too thin. By keeping the sow in good condition, the percentage of time that might otherwise be spent on supplementary feeding of piglets, relocating piglets to other sows, treating piglet illnesses, caring for/euthanizing dying piglets, and re-inseminating the sow in case of failure to become pregnant.

In 2015, the United Nations approved 17 Sustainable Development Goals, aiming to meet current needs without compromising the ability of future generations to meet their needs. Although there are no explicit links between animal welfare and the 17 sustainable goals, connections do exist (Keeling *et al.,* 2019). One example relates to Goal 13 “Climate Action”, where it can be argued that improved animal welfare increases the productivity and lifespan of animals, which in turn reduces the climate impact of production. Instead of constantly investing resources in replacing sows with new ones, fewer resources can be directed toward maintaining the existing sows. Another example relates to Goal 3 “Good Health and Well-being”, where enhanced animal welfare improves animals immune system, increasing their capacity to resist zoonotic diseases. By reducing exposure to zoonoses, the use of antibiotics can be decreased, thereby lowering the risk of antibiotic resistance (Keeling *et al.*, 2019).

Consumers and European citizens care about the welfare of food-producing animals, and there is added value in working to promote their welfare (Alonso *et al.,* 2020; European Commission, 2023). This presents an opportunity for producers to enhance animal welfare while charging more for the product. Ultimately, production becomes more ethical when the animals involved in food production are well treated, and there is a continuous effort to improve their welfare.

4.14 Method discussion

It was beneficial that a training day was held for the participating veterinarians before the assessments were carried out, to reduce the risk of different interpretations during the evaluations. Without the training day, the results of the assessments would likely have varied more depending on which veterinarian conducted the evaluation. Despite the training day, it is still likely that the veterinarians did not evaluate in exactly the same way, as people are different and

may focus on different details to varying degrees. To minimize uncertainty regarding how the occurrence of an indicator would be assessed, guidelines were created for the veterinarians to access. For example, it specified what should be defined as stereotypic behavior and what should not be included in that definition, which increases the assessments reliability. The guidelines also included pictures for added clarity. If the veterinarians could have practiced assessing the protocol out on farms several times before the actual evaluations were conducted, and thus had the opportunity to ask questions when uncertain (which can come up over time), they could have become more confident in their assessments. It would also have been beneficial to conduct inter-observer reliability tests beforehand to see if they were consistent in their evaluations, thereby yielding more reliable results. However, more training would have been optimal, it was a financial issue that was not feasible in practice at that stage of the study.

There is a potential for improvment regarding the protocols and guidelines that were developed in the project “Ask the Pig, as it sometimes lacks details of how the assessments were performed. This can hinder others who are not involved in the "Ask the Pig" project from replicating the assessments. However, the intention is for the protocols to be used by, among other stakeholders, herd veterinarians who are trained in the assessments. Nonetheless, there is further potential for improvement in elaborating how the indicators should be assessed.

Some uncertainty in the veterinarians' assessments and recording was observed as there were occasionally "missing values", which could be interpreted as either the indicator not being present or the recording being omitted for another reason (e.g. human factor or could not be observed). It would have been clearer when compiling the assessments if the veterinarians had been more explicit when filling out the assessment protocol, both to reduce the risk of misinterpretations and to obtain more from the assessments by avoiding the need to discard records due to ambiguity. In this study, missing values were interpreted as the veterinarian not having recorded the indicator as present. The data collection for this study was part of the development of the protocol, which means there is room for improvement. As veterinarians are trained and become accustomed to assessing the protocol, uncertainties will decrease, and knowledge will increase.

The random selection of assessed sows ensured that the evaluation was evenly distributed and fairly representative for the farms. Thus, not all the sows that deviated the most were chosen. Instead, the selection was made randomly to provide a representative picture distributed across the farm. While the random selection was beneficial, it may also have meant that the occurrence of indicators was not included in the assessment. It would have been optimal to perform

assessments on all sows to obtain the most accurate results possible. However, this would not have been time- or cost-effective. Since the protocol is to be used by, among others, veterinarians out on farms, it must be practically feasible to carry out.

The data on which the following study was based was collected from approximately 10% of Sweden's piglet production, which means that more farms need to be visited in the future to gather more data. The data collection was a first selection in an initial stage of developing an animal welfare benchmarking tool for Swedish pig production, and therefore, more data is needed to establish normal values for Swedish pig production, as well as to have sufficient data to compare with. Regarding the general associations between indicators that were examined, "similarity" could have been higher (closer to 100), indicating a stronger correlation. However, this study aimed solely to map general patterns of the associations between indicators. By mapping associations between the presence of animal-based welfare indicators, the efficiency of assessments can be improved. A clear example of an association identified in this study was the occurrence of dirty sows across all unit types. This suggests that the assessment of this indicator could be streamlined to just one unit type, making the evaluation more feasible. By examining potential associations, the reliability of the indicators can also be evaluated, as it may demonstrate that the indicators have been assessed similarly regardless of the evaluator.

4.15 Conclusion

In conclusion, the following study has found that there is variation in animal welfare indicators for sows on Swedish farms, with differences between farms, on relevant levels for benchmarking and improvement of pig welfare. The study has also identified relevant associations between welfare indicators. The results indicate that there is room for improved animal welfare on Swedish farms, and that the animal-based welfare indicators intended to be included in the welfare tool “Ask the Pig” are relevant to consider in the assessment. For future research, it would be interesting to explore the factors (e.g., management and housing) that underlie both the variation in, and the general associations between the prevalence of the welfare indicators.

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Popular science summary

Internationellt sett har Sverige en relativt liten grisproduktion, med mycket begränsad export av griskött, men med en självförsörjandegrad inom Sverige på 82%. Svensk grisproduktion karaktäriseras av lagstiftning som ställer höga krav vad gäller djurvälfärd, som bland annat förbjuder rutinmässig fixering av suggor och svanskupering av smågrisar. Dessutom har grisar inom svensk produktion större tillgänglig yta per djur samt tillgång till strömaterial för berikning och komfort. Sverige har även en lång tradition att hålla suggor tillsammans i grupper, med undantag för perioden för grisning och digivning.

Det finns ingen vedertagen definition av djurvälfärd, däremot finns det flera olika kända definitioner. En definition av djurvälfärd är att det är djurets förmåga att hantera den miljö djuret hålls i. En annan känd definition är de fem friheterna vilka lyder: 1. frihet från hunger och törst, 2. frihet från obehag, 3. frihet från smärta, skada och sjukdom, 4. frihet att uttrycka normalt beteende 5. frihet från rädsla och stress.

Det finns ett ökande intresse för att inkludera djurbaserade indikatorer i djurvälfärdsbedömningar, då dessa indikerar på hur djuret hanterar miljö och skötsel. Exempel på djurbaserade indikatorer är sådant som bedöms på djuret, såsom skador, renlighet och tillväxt. Genom att kartlägga variation i förekomst för olika djurbaserade indikatorer gårdar, möjliggörs jämförelse inom och mellan gårdar över tid och ett förbättringsarbete utifrån resultaten.

Examensarbetet utfördes som en del av projektet “Fråga grisen” vars mål är att ta fram ett bedömningsverktyg för djurvälfärd som är anpassat för svensk grisproduktion. Ett motsvarande verktyg finns idag tillgängligt för nötkreatur och används av rådgivningsföretaget Växa, såväl som ett obligatoriskt verktyg för förbättringsarbete inom den ekologiska certifieringen KRAV. Examensarbetets syfte var att kvantifiera och beskriva variationen av djurbaserade välfärdsindikatorer i svensk grisproduktion. Data samlades in från djurvälfärdsbedömningar från 27 svenska gårdar, vilket motsvarar ungefär 10% av Sveriges smågrisproduktion. Välfärdsbedömningarna utfördes mellan Juli 2022 och September 2023.

Resultatet från välfärdsbedömningarna visar att det fanns variation, d.v.s skillnader, mellan gårdar för de flesta djurbaserade indikatorerna som registrerades. Alla djurbaserade indikatorer kunde observeras åtminstone en gång i studien, förutom för indikatorn “suggor i akut behov av avlivning” som inte observerades i någon av gårdarnas grisningsavdelningar. Det fanns stor variation i

förekomst av indikatorn “renlighet (smutsiga suggor)”, där det fanns stora skillnader i andelen suggor som var smutsiga på gårdarna i alla avdelningstyper (grisning, dräktighet, parning). Låg förekomst och skillnad sågs för indikatorerna “suggor i behov av akut avlivning” samt “suggor som är för tunna”, vilket är positivt eftersom indikatorernas förekomst tyder på allvarliga brister i djurens välfärd och ska inte förekomma överhuvudtaget.

Baserat på resultaten från studien föreslås att de indikatorer som har undersökts, bör ingå i ett framtida verktyg för djurvälfärdsbedömning anpassat för svensk grisproduktion. Den litteratur som har gåtts igenom i studien har visat att många indikatorer påverkar varandra. Genom att undersöka och kartlägga vad variationen beror på, finns möjligheter för förbättringsarbete både inom och mellan gårdar. Resultatet visar även på att det finns samband mellan vissa av indikatorerna, vilket är av intresse för att kunna se hur förekomsten av olika indikatorer kan hänga samman.

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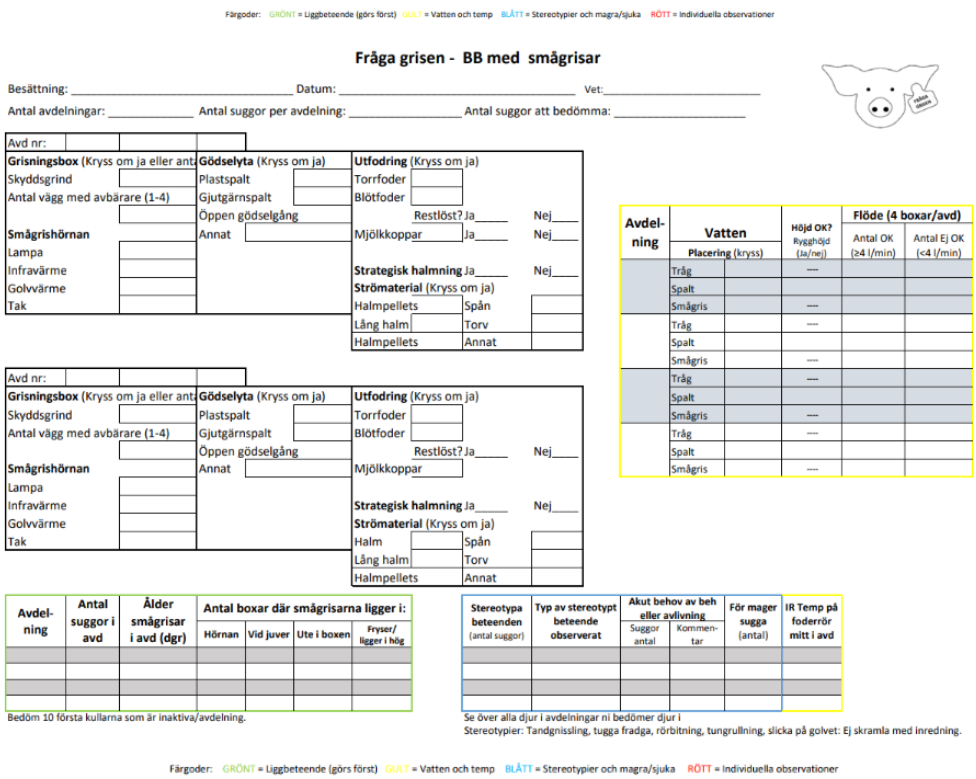
Appendix 1

The protocols developed within the project “Ask the Pig” that were used in the welfare assessments. The protocols are in Swedish. “BB med smågrisar” stands for farrowing units, “betäckning” for mating units, and “sin” for gestation units.



Färgoder: GRÖNT = Liggbeteende (görs först) GULT = Vatten och temp BLÅTT = Stereotypier och magra/sjuka RÖTT = Individuella observationer

Fråga grisen - BB med smågrisar

Besättning: _____ Datum: _____ Vet: _____

Antal avdelningar: _____ Antal suggor per avdelning: _____ Antal suggor att bedömma: _____

Avd nr:		
Grisningsbox (Kryss om ja eller ant	**Gödselyta** (Kryss om ja)	**Utfodring** (Kryss om ja)
Skyddsgrind	Plastspalt	Torrfoder
Antal vägg med avbärare (1-4)	Gjutgärnspalt	Blötfoder
	Öppen gödselgång	Restlöst? Ja____ Nej____
Smågrishörnan	Annat	Mjölkkoppar Ja____ Nej____
Lampa		**Strategisk halmning** Ja____ Nej____
Infravärme		**Strömaterial** (Kryss om ja)
Golvvärme		Halmpellets / Spån
Tak		Lång halm / Torv
		Halmpellets / Annat

Avd nr:		
Grisningsbox (Kryss om ja eller ant	**Gödselyta** (Kryss om ja)	**Utfodring** (Kryss om ja)
Skyddsgrind	Plastspalt	Torrfoder
Antal vägg med avbärare (1-4)	Gjutgärnspalt	Blötfoder
	Öppen gödselgång	Restlöst? Ja____ Nej____
Smågrishörnan	Annat	Mjölkkoppar
Lampa		**Strategisk halmning** Ja____ Nej____
Infravärme		**Strömaterial** (Kryss om ja)
Golvvärme		Halm / Spån
Tak		Lång halm / Torv
		Halmpellets / Annat

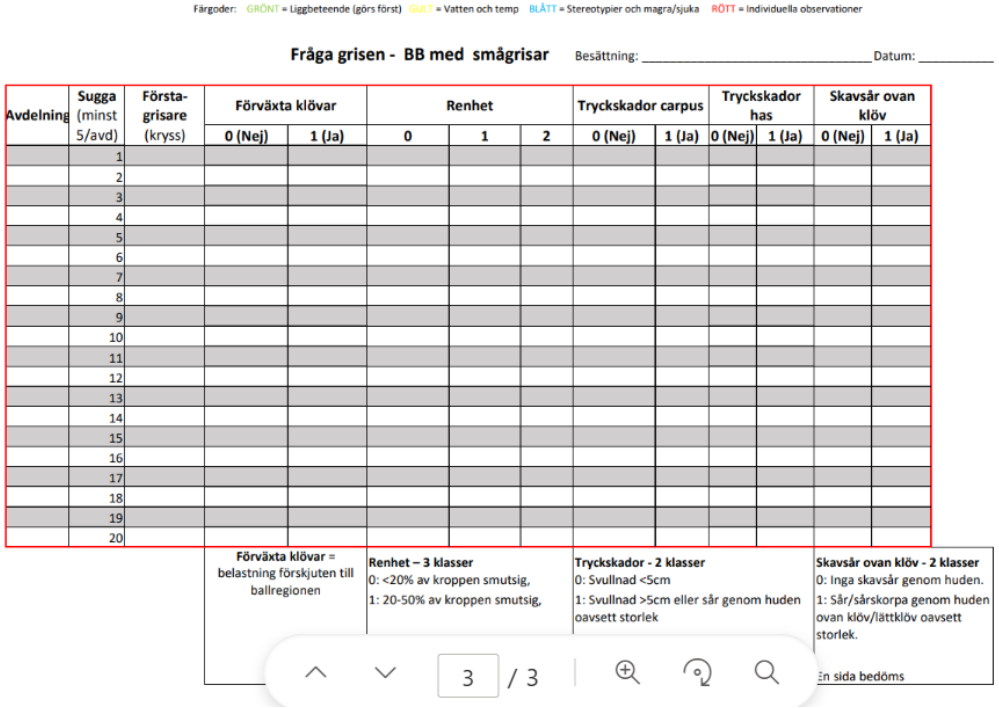
Avdel-ning	Vatten Placering (kryss)		Höjd OK? Ryggh.höjd (Ja/nej)	Flöde (4 boxar/avd) Antal OK (≥4 l/min)	Antal Ej OK (<4 l/min)
	Tråg		----		
	Spalt				
	Smågris		----		
	Tråg		----		
	Spalt				
	Smågris		----		
	Tråg		----		
	Spalt				
	Smågris		----		
	Tråg		----		
	Spalt				
	Smågris		----		

Avdel-ning	Antal suggor i avd	Ålder smågrisar i avd (dgr)	Antal boxar där smågrisarna ligger i: Hörnan	Vid juver	Ute i boxen	Fryser/ ligger i hög

Bedöm 10 första kullarna som är inaktiva/avdelning.

Stereotypa beteenden (antal suggor)	Typ av stereotypt beteende observerat	Akut behov av beh eller avlivning: Suggor antal	Kommen-tar	För mager sugga (antal)	IR Temp på foderrör mitt i avd

Se över alla djur i avdelningar ni bedömer djur i
Stereotypier: Tandgnissling, tugga fradga, rörbitning, tungrullning, slicka på golvet: Ej skramla med inredning.



Färgoder: GRÖNT = Liggbeteende (görs först) GULT = Vatten och temp BLÅTT = Stereotypier och magra/sjuka RÖTT = Individuella observationer

Fråga grisen - BB med smågrisar Besättning: _____ Datum: _____

Avdelning	Sugga (minst 5/avd)	Första-grisare (kryss)	Förväxta klövar 0 (Nej)	Förväxta klövar 1 (Ja)	Renhet 0	Renhet 1	Renhet 2	Tryckskador carpus 0 (Nej)	Tryckskador carpus 1 (Ja)	Tryckskador has 0 (Nej)	Tryckskador has 1 (Ja)	Skavsår ovan klöv 0 (Nej)	Skavsår ovan klöv 1 (Ja)
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	8												
	9												
	10												
	11												
	12												
	13												
	14												
	15												
	16												
	17												
	18												
	19												
	20												

Förväxta klövar = belastning förskjuten till ballregionen

Renhet – 3 klasser
0: <20% av kroppen smutsig,
1: 20-50% av kroppen smutsig,

Tryckskador - 2 klasser
0: Svullnad <5cm
1: Svullnad >5cm eller sår genom huden oavsett storlek

Skavsår ovan klöv - 2 klasser
0: Inga skavsår genom huden.
1: Sår/sårskorpa genom huden ovan klöv/lättklöv oavsett storlek.

En sida bedöms

Färgoder: SVART= basfakta GRÖNT = Liggbeteende (görs först) GULT = Vatten och temp BLÅTT = Stereotypier och magra/sjuka RÖTT = Individuella observationer

Fråga grisen - Betäckning suggor och gyltor Besättning: _____ Datum: _____

Avdelning	Ca antal suggor i hela avd/stallet	Stereotypa beteenden (antal suggor)	Typ av stereotypt beteende observerat	Akut behov av beh eller avlivning		För mager sugga (antal)
				Suggor antal	Kommentar	

Se över alla djur i avdelningar ni bedömer djur i

Stereotypier: Tandgnissling, tugga fradga, rörbitning, tungrullning, slicka på golvet. Ej skramla i indredningen

	Antal djur i gruppen/boxen	Liggbeteende: Antal suggor ligger på ej avsedd yta.		Vattenposter: Placering/ antal		Höjd OK = Rygghöjd (Ja/nej)	Antal OK (≥4 l/min)	Antal Ej OK (<4 l/min)	IR Temp i box
Box 1		Box 1		Tråg		----			
				Annan placering					
Box 2		Box 2		Tråg		----			
				Annan placering					
Box 3		Box 3		Tråg		----			
				Annan placering					
Box 4		Box 4		Tråg		----			
				Annan placering					

Hur många suggor ska jag bedöma i betäckningen? (Max 2v efter avv)

<100 SIP	>100 SIP	Kommentar
10 varav 3 första-grisare	20 varav 5 första-grisare	Bedöm endast djuren i den senast avvanda gruppen. Bedöm individerna jämnt fördelade över avdelningen om uppdelade i flera boxar. Minst 5 djur/box

Färgoder: SVART= basfakta GRÖNT = Liggbeteende (görs först) GULT = Vatten och temp BLÅTT = Stereotypier och magra/sjuka RÖTT = Individuella observationer

Fråga grisen - Betäckning suggor och gyltor (Max 2v efter avvänjning) Besättning: _____ Datum: _____

Urval: Starta med suggan närmast dig. När du är klart väljer du den individ som är fjärde närmast nosen på den sugga du precis tittat på.

Avdelning/ box	Sugga	Gylta (kryss)	Sår vulva		Bogsår			Renhet			Hälta		
			0 (Nej)	1 (Ja)	0 (Nej)	1 (<5 cm)	1 (>5cm)	0 (ren)	1 (halvskitig)	2 (skitig)	0 (måttlig)	1 (kraftig)	2 (blockhalt)
	1												
	2												
	3												
	4												
	5												
	6												
	7												
	8												
	9												
	10												
	11												
	12												
	13												
	14												
	15												
	16												
	17												
	18												
	19												
	20												

Sår vulva	Bogsår	Renhet – 3 klasser	Hälta - 3 klasser
Nej: Inget sår eller sår <2cm	0: Inget	0: <20% av kroppen smutsig	0: Normal gång eller upp till måttl hälta. Använder alla ben.
Ja: Sår, > 2cm, blödande eller under läkning med skorpa	1: Sårskorpa <5 cm 2: Sårskorpa >5 cm På en eller båda sidor	1: 20-50% av kroppen smutsig 2: >50 % av kroppen smutsig En sida bedöms	1: Kraftig hälta. Minimal vikt på aktuellt ben. 2: Blockhalt. Stödjer inte eller ligger.

Färgoder: SVART= basfakta GRÖNT = Liggbeteende (görs först) GULT = Vatten och temp BLÅTT = Stereotypier och magra/sjuka RÖTT = Individuella observationer

Fråga grisen - Sinavdelningen Besättning: _____ Datum: _____

Avdelning	Ca antal suggor i hela avd/stallet	Stereotypa beteenden (antal suggor)	Typ av stereotypt beteende observerat	Akut behov av beh eller avlivning		För mager sugga (antal)
				Suggor antal	Kommentar	

Se över alla djur i avdelningar du bedömer djur i

Stereotypier: Tandgnissling, tugga fradga, rörbitning, tungrullning, slicka på golvet. Ej skramla i indredningen

	Antal djur i gruppen/boxen	Liggbeteende		Vattenposter		Höjd OK =	Flöde		IR Temp i box
		Antal suggor ligger på ej avsedd yta.		Placering/ antal		Rygghöjd (Ja/nej)	Antal OK (≥4 l/min)	Antal Ej OK (<4 l/min)	
Box 1		Box 1		Tråg		----			
				Annan placering					
Box 2		Box 2		Tråg		----			
				Annan placering					
Box 3		Box 3		Tråg		----			
				Annan placering					
Box 4		Box 4		Tråg		----			
				Annan placering					

Hur många suggor ska jag bedöma i sinavdelningen?

<100 SIP	>100 SIP	Kommentar
10 varav 3 dräktiga gyltor	20 varav 5 dräktiga gyltor	Jämnt fördelade över olika dräktighetsgrupper. Endast grupper i stadium minst 30 dagar efter betäckning. Om 7 eller färre i boxarna. Titta på alla i boxen snarare än mindre antal i fler boxar. Om fler än 7, minst 5 individer per box jämt fördelade över olika dräktighetsgrupper.

Färgoder: SVART= basfakta GRÖNT = Liggbeteende (görs först) GULT = Vatten och temp BLÅTT = Stereotypier och magra/sjuka RÖTT = Individuella observationer

Fråga grisen - Individbedömning dräktighet (>30 dgr efter betäckning) Besättning: _____ Datum: _____

Box	Sugga	Gylta (kryss)	Sår framdel (en sida)			Sår bakdel (en sida)			Sår vulva		Renhet			Hälta		
			0 (<5 ytliga sår)	1 (5-10 ytliga sår)	2 (>10 ytliga sår eller 1 djupt sår)	0 (<5 ytliga sår)	1 (5-10 ytliga sår)	2 (>10 ytliga sår eller 1 djupt sår)	0 Nej (<2cm)	1 Ja (>2 cm)	0 (ren)	1 (halvskitig)	2 (skitig)	0 (måttlig)	1 (kraftig)	2 (blockhalt)
	1															
	2															
	3															
	4															
	5															
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	19															
	20															

Sår - bedöms på en sida av suggan uppdelat i fram- och bakdel
0: <5 sår
1; 5-10 sår
2:>10 sår. Djupa sår som går igenom huden bedöms alltid som en 2:a oavsett antal.

Sår på eller runt vulva
0: Inget sår eller sår <2cm
1: Sår, > 2cm, blödande eller under läkning med skorpa

Renhet – 3 klasser
0: <20% av kroppen smutsig,
1: 20-50% av kroppen smutsig,
2: >50 % av kroppen smutsig
Bedöms på en sida

Hälta - 3 klasser
0: Normal gång eller upp till måttl hälta. Använder alla ben.
1: Kraftig hälta. Minimal vikt på aktuellt ben.
2: Blockhalt. Stödjer inte eller ligger.

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