



Protocol for daily observations in the herds of the **PigIT** project

Kimmie Kyed Lyderik

Heidi Mai-Lis Andersen

Helle Halkjær Kristensen

Lene Juul Pedersen

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Centre for Herd-oriented Education, Research and Development
Department of Large Animal Sciences
University of Copenhagen

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Chapter 1

Introduction

The aim of the **PigIT** project is to improve welfare and productivity in weaner and finisher pigs by using advanced ICT methods. Observations of behavioral problems and data related to climate and water consumption are used to create an early warning system, which can detect patterns reflecting impaired production and welfare. Data is collected from several herds and this report is a description of the observational protocol used in the **PigIT** project.

Chapter 2

General principles of the PigIT observation protocol

All test farms perform daily observations of the following parameters at pen level:

- Diarrhoea
- Tail biting
- Fouling

The observations are performed at the same time every day. Details regarding ratings and registrations of these parameters will be described in the following subsections.

Observations are registered using tables designed for the purpose, however, there are slight differences in the registration and treatment options used at the different test farms. These differences will be described in more detail in the chapters regarding each test farm.

All test farms have an assigned technician, who visits the farm regularly. The technician and the responsible employees calibrate their daily observations to ensure the same ratings are given over time, so the scale behind the ratings does not drift throughout the experimental period.

Assessment of Diarrhoea

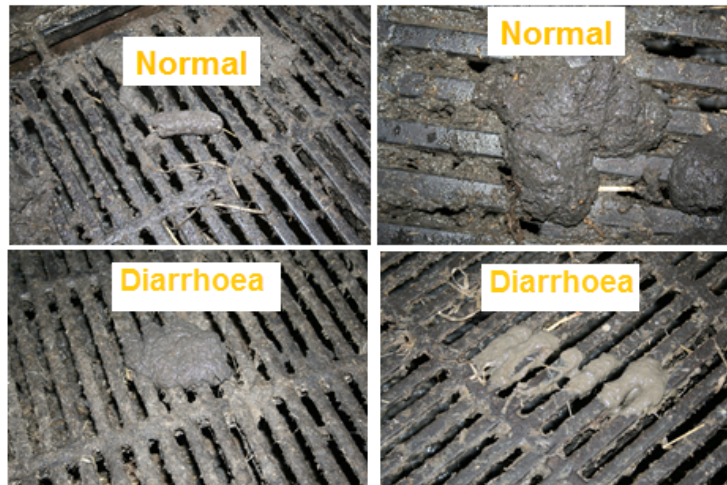


Figure 2.1: Assessing whether faecal matter is normal or diarrhoea.

2.1 Diarrhoea

Diarrhoea is the occurrence of abnormal faeces, where the fecal consistency is liquid or runny. It can be a symptom of health problems and problems related to production and welfare. In the PigIT project the occurrence of diarrhoea is observed at all test farms.

The floor of every experimental pen is examined from the aisle, and faecal matter is determined to be either normal or diarrhoea in accordance with Figure 2.1. The number of diarrhoea droppings are counted and noted in the observation table. The number of droppings are assessed in accordance with Figure 2.2 and the following guidelines:

- Diarrhoea droppings in the entire pen are counted from the aisle
- One isolated dropping is counted as one dropping
- Two connected droppings of diarrhoea are counted as one dropping
- A line or trickle of diarrhoea is counted as one dropping
- Two adjacent unconnected diarrhoea droppings are counted as two droppings

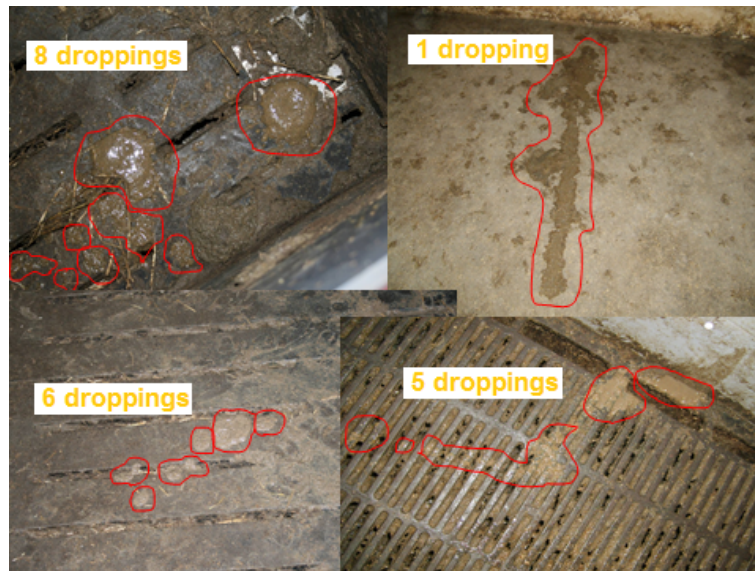


Figure 2.2: Assessing the number of droppings.

2.2 Tail biting

Tail biting is an unwanted behavioral problem, where pigs orally manipulate the tails of their pen mates. Tail biting is observed and registered at pen level, and three parameters are assessed according to Figure 2.3.

The parameters are:

- Tail length
- Tail injuries
- Freshness of blood

As the red markings in Figure 2.3 indicate, a pen is assessed as having a tail biting outbreak, when the following is observed:

- At least one pig has a shortened tail (Tail length score 1-2)
- At least one pig has an open wound on the tail (Tail injury score 3-4)
- At least one pig has visible blood on the tail (Freshness of blood score 3-4)

Registration and treatment options of tail biting differs between the test farms, and these differences are described in the separate chapters assigned to each farm.










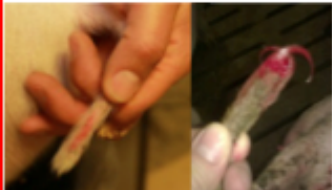


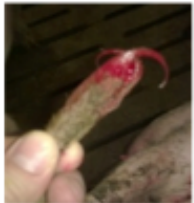
Tail length (0-2)	Tail injuries (0-4)	Freshness of blood (0-4)
<p>0 - No Shortening</p> 	<p>0 - No injury</p> 	<p>0 - No blood</p> 
<p>1 - Shortened to a length of > 2 cm</p> 	<p>1 - Red and/or swollen</p> 	<p>1 - Visible scabs</p> 
<p>2 - Shortened to a length of < 2 cm</p> 	<p>2 - Bite marks (little dots on the tail)</p> 	<p>2 - Scabs and redness</p> 
<hr/> <p>A pen is registered as having a tail biting outbreak, when at least one pig in the pen has a tail, which is assessed to be within the red markings</p>	<p>3 - Open wound (missing tissue)</p> 	<p>3 - Old red/brown blood</p> 
	<p>4 - Open wound and swollen</p> 	<p>4 - Fresh blood</p> 

Figure 2.3: Assessment of tail biting.

2.3 Fouling

Fouling is an unwanted behaviour, where pigs use the intended resting and laying area for dunging. Hence, fecal matter accumulates in the wrong part of the pens affected.

Naturally, the occurrence of fouling is assessed at pen level, and is observed from the aisle. The occurrence of fouling is assessed to be present, if at least one fourth of the laying area is polluted. The extent of fouling is registered as:

- Accumulation of fecal matter in one fourth of laying area
- Accumulation of fecal matter in half of the laying area
- Accumulation of fecal matter in the entire laying area

These three pollution levels are used at all included test farms, however, the treatment of fouling differs slightly between the test farms. The different treatment options can be seen in Table 3.1, 4.1 and 5.1.

Chapter 3

Observations at Kappel farm

At Kappel farm, daily registration of observations are done with a Personal Digital Assistant (PDA), where the results are organized as the table shown in Appendix A section A.1. Diarrhoea, tail biting and fouling are observed at pen level, and the following parameters are registered:

Diarrhoea: Occurrence, number of droppings and treatment

Tail biting: Occurrence, ID-number of pigs removed and treatment

Fouling: Occurrence, share of laying area and treatment

The treatment options for all 3 parameters are shown in Table 3.1.

Calibration of observations is done once per batch of experimentally used pigs, and is done at every insertion of finishers, when the assigned technician visits.

Table 3.1: Treatment options at Kappel farm

Observed	Treatment
Diarrhoea	None Pig treated Pen treated Section treated
Tail biting	none, Pigs removed Biter removed Allocation of rooting material Allocation of rope or toy
Fouling	None Medical treatment Temperature regulation or shower adjustment

Chapter 4

Observations at Grønhøj farm

At Grønhøj farm daily registration of observations are done with an auto-pen, which sends the registrations to a data base at The Danish Pig Research Centre. From there, the data is send as XML-files, which is then added to the PigIT database. When using the auto-pen, results are noted in a table, as is shown in Appendix A section A.2.

Diarrhoea, tail biting and fouling are observed at pen level, and the following parameters are registered:

Diarrhoea: Number of droppings

Tail biting: Number of pigs affected and treatment

Fouling: Share of laying area and treatment

Calibration of observations is performed once per month, when the assigned technician visits.

Treatment of diarrhoea is registered in a separate system for all medical treatments administered at Grønhøj farm. If diarrhoea is medically treated, the treatment and number of treated pigs will be noted and made available for entry in the PigIT database.

Treatment options of tail biting and fouling can be seen in Table 4.1.

Table 4.1: Treatment options at Grønhøj farm

Observed	Treatment
Tail biting	None
	Removal of biter
	Allocation of rope or mineral block
Fouling	Oil of hartshorn
	None
	Medical treatment
	Temperature regulation or shower adjustment
	Allocation of bedding
	Stalosan
	Scrape down of pen

Chapter 5

Observations at Søndergaard farm

At Søndergaard farm, the daily registration of observations are done by hand and noted in a table, as the one shown in Appendix A section A.3. Diarrhoea, tail biting and fouling are observed at pen level, and the following parameters are registered:

Diarrhoea: Occurrence, number of droppings and action

Tail biting: Occurrence, number of bites/pigs affected and action

Fouling: Occurrence, share of laying area and action

At Søndergaard farm the registration of treatments is a bit different, as these are categorized as "Actions". Action options for diarrhoea, tail biting and fouling can be seen in Table 5.1.

Calibration of observations is done once per batch of experimentally used pigs, and is done at every insertion of finishers and weaners, when the assigned technician visits.

Table 5.1: Actions at Søndergaard farm

Observed	Action
Diarrhoea	None
	Pig treated
	Pen treated
	Section treated
Tail biting	None
	Removal of biter
	Allocation of Bite Rite
	Febrimin
	Allocation of straw
	Allocation of alfalfa green meal
	Allocation of sisal rope
	Allocation of wooden sticks on floor
	Allocation of wooden sticks in chains
	Allocation of mineral block
Fouling	None
	Scrape down of pen
	Allocation of shavings
	Temperature regulation or shower adjustment

Appendix A

Tables used for registering observations

A.1 Kappel farm

Afp-1215
Registrering af Diarre, Halebid og Svineri

Dato:

Sti/ventil-nr.	Hvis Alle = 0 Skriv "0"	Diarre		Halebid		Svineri	
		Forekomst	Behandling	Forekomst	Behandling	Forekomst	Behandling
2 V							
2 H							
8 V							
8 H							
16 V							
16 H							
23 V							
23 H							
29 V							
29 H							
37 V							
37 H							
58 V							
58 H							
63 V							
63 H							

Koder diarre: 0 = ingen 1 = ja Hvis: tælles og noteres antal klatter. Behandling: 1 = ingen 2 = gris behandlet 3 = sti behandlet 4 = sektion behandlet	Koder halebid: 0 = ingen 1 = ja Behandling: 5 = ingen 6 = gris udtaget 7 = "synder udtaget" 8 = tildelt rodemateriale/reb/legetøj	Koder svineri: 0 = ingen 1 = ja Andel af leje: 9 = ¼ 10 = ½ 11 = hele lejet Behandling: 12 = ingen 13 = medicinerig 14 = temperatur-regulering/overbussning justeret
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Figure A.1: Original schematic representation of the registrations made at **Kappel farm** by use of a PDA.

Date:

Afp-1215

Registration of Diarrhea, Tail biting and Fouling

Pen/ventil no.	Diarrhea		Tail biting		Fouling	
	Occurrence	No. of droppings	Occurrence	ID no. of pig removed	Occurrence	Share of laying area
2 V						
2 H						
8 V						
8 H						
16 V						
16 H						
23 V						
23 H						
29 V						
29 H						
37 V						
37 H						
58 V						
58 H						
63 V						
63 H						

Codes for Diarrhea: 0 = None 1 = Yes
If Yes: The number of droppings is counted and noted
Treatment: 1 = None 2 = Pig treated 3 = Pen treated 4 = Section treated

Codes for Tail biting: 0 = None 1 = Yes
Treatment: 5 = None 6 = Pigs removed 7 = "Biter removed" 8 = allocation of rooting material/ropel/oy

Codes for Fouling: 0 = No 1 = Yes
Share of laying area: 9 = 1/4 10 = 1/2 11 = Entire laying area
Treatment: 12 = None 13 = Medical treatment 14 = Temperature regulation/showering adjusted

Figure A.2: Translated schematic representation of the registrations made at **Kapel farm** by use of a PDA.

A.2 Grønhøj farm

Afp.Nr.		1325		Besætning		99189		Stald		K 8	
		Diarre		Halebid				Svineri			
		Foreko		Foreko		Handling		Forekomst		Handling	
		Tjekket		Antal klatter		Antal med halebid		Ingen		Syrnder udtaget	
		Ingen		Reb / siliksten		Hjortetakssolie		1/4 leje		1/2 leje	
		Hele lejet		Ingen		Medicin		tempo. / brus		Strø / stalscan	
		Skræbe ned									
Dato	Sti										
	3										
	6										
	8										
	12										
	3										
	6										
	8										
	12										
	3										
	6										
	8										
	12										
	3										
	6										
	8										
	12										
	3										
	6										
	8										
	12										
	3										
	6										
	8										
	12										

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Figure A.3: Original schematic representation of the registrations made at **Grønhøj farm** by use of an auto-pen.

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Date	Pen	Assessed	Diarrhoea	Tail biting					Fouling							
			Occ.	Occ.	Treatment				Occ.	Treatment						
			No. of Droppings	No. of pigs with tail bites	None	Biter removed	Repellent block	Oil of Hartshorn	1/4 laying area	1/2 laying area	Entire laying area	None	Medicine	Temp./shower	Bedding/Stalosan	Scrape down
	3															
	6															
	8															
	12															
	3															
	6															
	8															
	12															
	3															
	6															
	8															
	12															
	3															
	6															
	8															
	12															
	3															
	6															
	8															
	12															

Figure A.4: Translated schematic representation of the registrations made at **Grøn-høj farm** by use of a auto-pen.

A.3 Søndergaard farm

Afp-1389
Daglige registrering af Diarre, Halebid og Svineri – Smågrisesektion 5

Dato: _____

Sti-nr.	Hvis Alle = 0 Skriv "0"	Diarre		Halebid		Svineri				
		Forekomst	Antal klatter	Indsats	Forekomst	Antal	Indsats	Forekomst	Andel af leje	Indsats
1										
2										
5										
6										
7										
8										
11										
12										

Koder diarre: 0 = ingen 1 = ja Hvis: tælles og noteres antal klatter Indsats: 1 = ingen 2 = gris behandlet 3 = sti behandlet 4 = sektion behandlet	Indsats koder: 0 = ingen 1 = Ja 1 = Btte Rite 2 = Febrimin 3 = Halm 4 = Lucerne grønmæl 5 = 6 = Sisal reb 7 = Bider udtaget Husk at notere nummeret! 8 = Pinde på gulv 9 = Pinde i kæder 10 = Mineralblok	Koder svineri: 0 = ingen 1 = ja Andel af leje: 9 = ¼ 10 = ½ 11 = hele lejet Behandling: 12 = ingen 13 = skraber ned /strøer spåner 14 = temperatur-regulering/overbrusning justeret
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Figure A.5: Original observation table used for weaner registrations at **Søndergaard farm**.

Date: _____ Afp-1389 Daily observations of Diarrhea, Tail biting and Fouling – Weaner section 5

Pen no.	Diarrhea		Tail biting		Fouling	
	Occurrence	No. of droppings	Occurrence	Action	Occurrence	share of laying area
1						
2						
5						
6						
7						
8						
11						
12						

<p>Codes for diarrhea: 0 = None 1 = Yes</p> <p>If Yes: The number of droppings is counted and noted</p> <p>Action: 1 = None 2 = Pig is treated 3 = Pen is treated 4 = Section is treated</p>	<p>Action codes for tail biting: 0 = None 1 = Yes</p> <p>1 = Bite Rite 2 = Febrimin 3 = Straw 4 = Alfalfa green meal 5 = 6 = Sisal rope 7 = Biter is removed Remember to note the ID-number 8 = Sticks on the floor 9 = Sticks in chains 10 = Mineral block</p>	<p>Action codes for fouling: 0 = No 1 = Yes</p> <p>Share of laying area: 9 = ¼ 10 = ½ 11 = Entire laying area</p> <p>Action: 12 = None 13 = scrape down / allocate shavings 14 = temperature regulation / showering is adjusted</p>
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Figure A.6: Translated observation table used for weaner registrations at **Søndergaard farm**.

Dato: _____ Daglige registrering af Diarre, Halebid og Svineri – Slagtesvinesektion 3

Sti-nr.	Hvis Alle = 0 Skriv "0"	Diarre		Halebid		Svineri				
		Forekomst	Antal klatter	Indsats	Forekomst	Antal	Indsats	Forekomst	Andel af leje	Indsats
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Koder diarre: 0 = ingen 1 = ja Hvis: tælles og noteres antal klatter Indsats: 1 = ingen 2 = gris behandlet 3 = sti behandlet 4 = sektion behandlet	Indsats koder: 0 = Ingen 1 = Ja 1 = Bite Rite 2 = Febrimin 3 = Halm 4 = Lucerne grønme 5 = 6 = Sisal reb 7 = Bider udtaget Husk at notere nummeret! 8 = Prinde på gulv 9 = Prinde i kæder 10 = Mineralblok	Koder svineri: 0 = ingen 1 = ja Andel af leje: 9 = ¼ 10 = ½ 11 = hele lejet Behandling: 12 = ingen 13 = skraber ned /strør spåner 14 = temperatur-regulering/overbrusning justeret
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Figure A.7: Original observation table used for finisher registrations at **Søndergaard farm**.

Date: _____ Afp-1389 Daily observations of Diarrhea, Tail biting and Fouling – Finisher section 3

Pen no.	Diarrhea		Tail biting		Fouling	
	Occurrence	No. of droppings	Occurrence	No.	Occurrence	share of laying area
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

<p>Codes for diarrhea: 0 = None 1 = Yes</p> <p>If Yes: The number of droppings is counted and noted</p> <p>Action: 1 = None 2 = Pig is treated 3 = Pen is treated 4 = Section is treated</p>	<p>Action codes for tail biting: 0 = None 1 = Yes</p> <p>1 = Bite Rite 2 = Febrimin 3 = Straw 4 = Alfalfa green meal 5 = 6 = Sisal rope 7 = Biter is removed Remember to note the ID-number 8 = Sticks on the floor 9 = Sticks in chains 10 = Mineral block</p>	<p>Action codes for fouling: 0 = No 1 = Yes</p> <p>Share of laying area: 9 = ¼ 10 = ½ 11 = Entire laying area</p> <p>Action: 12 = None 13 = scrape down / allocate shavings 14 = temperature regulation / showering is adjusted</p>
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Figure A.8: Translated observation table used for finisher registrations at Søndergaard farm.