

# Description of Grønhøj farm

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

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# Introduction

PigIT is a project to improve welfare and productivity in growing pigs using advanced ICT methods. Data collection in the project is done in several herds and this is a description of the herd Grønhøj.

Grønhøj is located in the middle of Jutland in Karup. Grønhøj has been a test station since 1971 and is owned by the Danish Pig Research Centre (PRC). Besides the function of test station, Grønhøj has an annual production of 9,500 weaners (7-30 kg) and 9,100 finishers (30-107 kg). There is a capacity for feed trials with 120 weaner pens and 232 finisher pens. Typically there are 3-7 feed trials a year with 4-6 different diets in each trial. Besides the feed trials, there is capacity for environmental trials with 56 pens which are climate labs with chambers. There are 18 chambers with 2 pens in each chamber and 2 chambers with 10 pens in each chamber. These are normally used for around 2-3 environmental trials a year. Grønhøj previously also had a sow unit, but this ended in 2004. The health status is currently blue SPF.

For the PigIT project, registrations for finishers as well as weaners are done at Grønhøj, and this report will include descriptions of both. For the finishers, six chambers in two climate labs are used. For the weaners, 16 weaner pens in four weaner sections are used.

# **Buildings**

### 1.1 Pen design

#### 1.1.1 Weaners

At Grønhøj, four weaner sections (K8, K9, K10 and K11) are used for the PigIT project. Each section consists of 12 pens. In the project, four pens from each section, in total 16 pens, are used. The yellow pens shown in Figure 1.1 are those used in each section for the PigIT project. Each pen measures approximately  $1.4 m \times 1.5 m$  and there are 14 or 15 weaners in each pen. The length and width of each pen varies a bit among pens, but the overall area is the same. The floor composition in the weaner pens is 50% slatted and 50% solid floor as it is seen in Figure 1.2.



Figure 1.1: Schematic overview of the weaner sections.

#### 1.1.2 Finishers

Two climate labs (number 1 and 3) are used for the PigIT project at Grønhøj. Each lab consists of six chambers. In the project three chambers with two pens in each are used from each lab. Thus, in total, registrations are collected from 12 finisher



Figure 1.2: One weaner pen and floor composition.

pens. The pens that are used are shown in Figure 1.3a and 1.3b for both Lab 1 and 3. Each chamber measures  $4.86 \ m \ge 4.80 \ m$  and each pen measures  $4.80 \ m \ge 2.40 \ m$  and there are 15 finishers in each pen.

The floor composition varies from chamber to chamber. In all three chambers in Lab 3 and in Chamber 1 in Lab 1 the floor is composed of 1/3 drained in the

Sii 1001	Sti 1002	Sti 1003	Sti 1004	Sti 1005	Sti 1008
		N			
chamber 1		chamber 2		chamber 3	

(a) Pens and chambers used in climate Lab 1.

Sii 3001	Sti 3002	St 3003	Sii 3004	Sü 3007	Sti 3008			
chamber 1		chamber 2		chamber 3				

(b) Pens and chambers used in climate Lab 3.

Figure 1.3: Schematic overview of the climate labs.

lying area and 2/3 slatted. The floor consists of 1/3 solid in the lying area and 2/3 slatted in the other two chambers in climate Lab 1. This is shown in Figure 1.4a and 1.4b.

### 1.2 Climate

#### 1.2.1 Weaners

The weaner pens are so-called two-climate pens where a shelter can be opened manually. The ventilation is a balanced pressure ventilation and the system is a KJ control system, which is shown in Figure 1.5a and 1.5b. Furthermore, the floor is heated in the weaner section, Figure 1.5c.

#### 1.2.2 Finishers

The finisher pens are ventilated trough diffuse ventilation with a Fancom control system and the ceiling is covered with wood wool plates from Troldtekt. The ventilation and control system is shown in Figure 1.6a and 1.6b.



(a) Two pens in one chamber with floor composition of 1/3 solid and 2/3 slatted.



(b) Two pens in one chamber with floor composition of 1/3 drained and 2/3 slatted.

Figure 1.4: Two different floor compositions in the finisher pens.



(c) Floor heating.







(a) Fancom control system.

(b) Diffuse ventilation and wood wool plate.

Figure 1.6: Climate chamber.

### **Cameras and sensors**

For the PigIT project sensors and cameras are placed in the pens used for the project, 12 finisher pens and 16 weaner pens. There are some differences between the weaner and finisher pens, but so little that the description of the sensors and cameras for both groups are merged together.

#### 2.1 Sensors

The sensors in the weaner and finisher pens are installed to measure both at pen and section level. The sensors collect the following data:

- Pen level
  - Temperature (at two positions)
  - Water consumption
  - Feed consumption
- Section level
  - Temperature
  - Humidity

The temperature is recorded by use of probes, see Figure 2.1c, which are connected to temperature sensors. See Figure 2.1a for weaner pen and Figure 2.1b for finisher pen. In each pen, weaners as well as finishers, two probes are installed, in total 32 in the weaner pens and 24 in the the finisher pens. One of the temperature probes in the weaner pen is placed in the front and the other one is placed on the back wall. The two probes in the finisher pen are placed on the same wall, one in the front and one in the back. The placement of the probes can be seen in Figure 2.2a and 2.2b. The registrations of the temperature is measured at pen level, for section level the registrations are collected from the climate computers for both temperature and humidity.



(b) Temperature sensor in finisher pen.





In addition to the temperature, feed and water consumption at pen level is registered. The feed consumption registrations are collected from the feeding system, see Chapter 4 and the water consumption is monitored by flow meters. A flow meter is connected to the water bowl in each pen and measures the water consumption for each pen both for weaners and finishers. Figure 2.3 shows a flow meter in the weaner pen, and a flow meter in the finisher pen can be seen in Figure 2.2b.

#### 2.2 Cameras

In addition to the sensors, cameras are installed above all pens. The video recordings from these cameras, Figure 2.4, are intended for weight assessment and for activity monitoring. In the weaner section one centered camera is installed above each pen, whereas two cameras, one in the front and one in the back, are installed above each finisher pen as shown in Figure 2.5a and 2.5b.

### Grønhøj herd description



(a) Weaner pen.



(b) Finisher pen.

Figure 2.2: Temperature probes in both finisher and weaner pens.



Figure 2.3: Flow meter.

### Grønhøj herd description



Figure 2.4: Video recordings.



(a) Camera in weaner pen.



(b) Camera in finisher pen.

Figure 2.5: Cameras at Grønhøj.

# Animals

Weaned pigs are received from the same farmer at a weight of approximately 7.5 kg. Grønhøj receives 190 weaned pigs every Friday and they are sorted by gender and size. The pigs are in a weaner section for eight weeks, whereas every Monday a weaner section is cleaned and the pigs are moved to the finisher sections. If there are pigs in some of the other weaner sections that should be moved within the next two weeks, and the pigs have a weight of at least 29 kg, these pigs are moved to the finisher sections as well.

All the animals, both in the weaner- and the finisher pens should have access to sufficient amount of straw or other manipulable materials which meet the animals need for rooting and enrichment materials. The animals, both in the weanerand the finisher pens, are provided with wooden sticks placed on the walls, see Figure 3.1.



(a) Finisher pen.

(b) Weaner pen.



# Feed

Since Grønhøj is used as a test station for primarily feeding trials, the weaners and finishers used for the PigIT project are not fed with the same diet and amount since they are not in the same trials. But in general both the weaners and the finishers are fed ad libitum with dry feed. The feeding system at Grønhøj is a BoPil SpotMix system, Figure 4.1, which is ideal when dealing with feeding trials, since the system can allocate different diets to individual pens and/or sections.

Each pen, both weaner and finisher, is equipped with one water bowl and one feeding trough, see Figure 4.2. The feeding trough, both in the weaner pens and in the finisher pens, has two feeding points.

#### Grønhøj herd description



(a) Feeding system.



(b) Feeding pipes.



(c) Multiple fase feeding with SpotMix.





(a) Water bowl in finisher pen.



(b) Feeding trough in finisher pen.



(c) Feeding in weaner pen.

Figure 4.2: Feeding and drinking.

# Labor and management

Four employees take care of the pigs every day and carry out the trials together with two technicians. Every day the employees register the following with an auto-pen which automatically sends the registrations to a database.

- Diarrhea
- Pen fouling
- Tail biting
- Removal and insertion of pigs

Besides the registrations that are automatically sent to the PigIT database, all animals used for the PigIT project are weighted when the animals are inserted at section level. The weaners are hereafter weighted again after 12 weeks and again when they are removed from the weaner pens. The finishers are only weighted again at departure.



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