

# Combined pasture and housing systems in Denmark: special outdoor feed troughs for pregnant sows

## Description

Sows are on pasture all year round. Only during insemination the sows are brought indoors for about 7 days in groups of 20 sows. On pasture lactating sows have individual paddocks and pregnant sows stay in groups of 6-18 sows. Huts are bedded with straw. Besides fresh grass, the sows get additional roughage during winter together with concentrate. The farmer invented special feed troughs for the pregnant sows on pasture.

Piglets are weaned at 7 weeks of age. All weaners are housed indoors, with access to an outdoor run, in groups of 190-220 pigs. They have a straw bedded area indoor and partly slatted floors indoors as well as outdoors. They have ad libitum access to concentrate indoors as well as access to roughage indoors and outdoors.

At around 35 kg bodyweight, the pigs are sold to another farmer, who raises the growing-finishers indoors with an outdoor run.

## Pasture management

The farm cooperates with another farmer, who cultivates the pasture areas in-between groups of pigs. A pasture area is used for approximately half a year and then for one year of cultivation.

Before sows are moved to a new area, it is cut and used as roughage. Both pregnant and lactating sows are moved continuously to new pasture areas for 3 months. Used pasture areas are then reseeded. Organic sows in Denmark are allowed to have nose rings; therefore, they cannot cause severe damage to the vegetation. During the summer and autumn of the project period, the vegetation covered 70-90 % of the pasture areas with pregnant sows and during winter on average 40-50 %.



## Farm portrait

### Location

Jutland, Denmark

### Topography

Flat

### Farmland

95 ha pasture and arable crops

### Size of pig herd

222 sows, 5,300 weaners

### Farming system

- Pregnant and lactating sows are housed on the pasture.
- During service, empty sows are housed indoors
- Weaners are housed indoors with an outdoor run.





To reduce ear lesions in weaners kept indoors in groups of 190–220 animals, the farmer provides easily accessible minerals.

## Animal welfare

Clinical assessments of pregnant sows show no major welfare problems, only some skin lesions can be observed. Scratches are assumed to arise during mixing in the service area after being on an single paddock during lactation. During the project period only 4 out of 333 sows had vulva lesions; one had deformations as well (see table 1). Lameness was not a problem. Soiling with mud was widespread during summer, but this is not considered to be a welfare issue. Sunburns on ears can be sporadically seen during summer but were not a major issue for sows on pasture.

For weaners, ear lesions were the most prominent welfare issue (see table 1). The farmer started providing extra and easily accessible minerals (magnesium oxide and monocalcium oxide) to mitigate this problem, which seems to help. Runts can be seen in a few pens, but diarrhoea and tail lesions were not a problem.

Sows on pasture didn't perform negative behavioural manipulation of other sows, huts or feed troughs. For the weaners, this was also not the dominant behaviour observed.

## Environmental impact and productivity

- The indoor area, where weaners are kept, is cleaned weekly, whereas the outdoor run is cleaned daily. During the project period, the outdoor slatted floor area was scored as the dirtiest, but never more than 50 % of the area was soiled. The remaining areas had good hygiene. The service area had slightly poorer hygiene although cleaned daily.
- The farm has a medium level of carbon footprint (greenhouse gasses = GHGs) in the breeding system of 4.91 kg CO<sub>2</sub> equivalents per kg of weaned piglet. Emissions from manure storage are higher as the weaners are housed with an outdoor run. The extensive use of external feeds also creates issues of higher eutrophication impacts due to the imported nutrients. However, the farm achieves high productivity of 27 weaned piglets per sows per annum, and a weaner live weight gain of 0.532 kg per day.

**Table 1: Welfare assessment**

Age group	Welfare parameter	Assessment during project period
Weaners	Ear lesions	In 5 out of 9 pens: < 3 %; in 1 pen: > 3 %
Weaners	Manipulation of other pigs, feeders etc.	Not a dominant behaviour
Weaners + Sows	Short tails / tail biting, diarrhoea	Not detected
Weaners	Runts	A few in 3 out of 9 pens
Sows	Skin lesions (scratches)	22 out of 333 sows
Sows	Sunburns on ears	10 out of 333 sows
Sows	Soiling, in summer	Half of the sows: < 30 % of body muddy
Sows	Vulva lesions or deformations	4 out of 333 lesions, 1 lesion + deformation
Sows	Lameness	Not detected
Sows	Manipulation of other sows, huts, etc.	Not detected





The farmer invented special feed troughs for pregnant sows on pasture. These troughs attempt to reduce feed waste as sows have to open the lids to access the feed, preventing birds or rodents from getting to the feed.

## Labour and cost

- This housing system for sows is labour intensive, since most work tasks, such as feeding sows on pasture, providing roughage or renewing of bedding, are done by hand. In some pens removing manure can be done by machine, which saves on the workforce.
- The farm has three full-time employees. Only one of them is involved in management, one is mainly dealing with the sows and the third employee works both with the sows and weaners.
- It is crucial for the farmer that there is a good collaboration between the staff, so everybody likes to work. He would like to have more tasks automated, e.g. providing bedding and washing stables.

## Take away lessons

- This farmer is very aware of the environmental impact of his farm. Focusing on the pasture management, he tries to mitigate the impact, having a somewhat different rotational system than the average Danish pig producer.
- Innovative ideas can lead to inventions like the farmer's feed troughs that helps to reduce feed waste on the pasture, which is good for both, the environment and revenue.

**Table 2: Productivity**

<b>Productivity</b>	<b>Sow</b>
Average no. of litters / sow / year	2.0
Average no. of piglets born/ Litter	17
Average no. of piglets weaned / Litter	13
Average no. of litters / sow until culling	2.7
Feed usage / sow / year [kg]	1,329 <sup>1</sup>
<b>Productivity</b>	<b>Weaners</b>
Average daily weight gain [g / day]	532
Feed conversion rate [kg / kg gain]	2.7
<b>Environmental impact</b>	<b>Weaners</b>
GHGs <sup>2</sup>	4.91
Terrestrial eutrophication [molc N] <sup>3</sup>	0.62
Marine eutrophication [kg N] <sup>3</sup>	0.106
Water footprint [m <sub>3</sub> ] <sup>3</sup>	0.097

<sup>1</sup>concentrate + pasture

<sup>2</sup>Green house gases [CO<sub>2</sub>-Equivalent] per [kg] weaned piglet

<sup>3</sup>per [kg live weight] weaned pig



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