

# Combined pasture and housing systems in Germany: year-round outdoor housing for pregnant sows

## Description

In Germany, most organic pigs are kept in barns with concrete outdoor runs. This farm is a best practice example of the combination of indoor and outdoor housing throughout the breeding cycle.

Empty sows, pregnant sows and the boar are kept in one large group on pasture from spring to fall. Equipment on the pasture includes straw-bedded huts, sun protection and wallows. In addition to the fresh grass-clover pasture, the pigs receive some concentrate feed daily. During winter pasture is not possible due to frequent water logging; instead, the sows are kept on concrete run with huts.

Before farrowing, sows are placed in individual farrowing pens. Here they stay for approximately two weeks and are then moved to a group housing system. Piglets are weaned after seven weeks. Weaners and growing-finishing pigs are kept in groups of ten to sixty animals. All animals housed indoors receive clover grass silage every day.

## Pasture management

The farm has a six-year crop rotation, with the sows grazing clover grass in its second year. The annual change of the pasture avoids hygiene problems, such as parasite infestation and infectious diseases. In addition, the nutrient input can be controlled in this way.

The grazing season usually lasts from April to November. Since the vegetation decreases over time, access to a fresh pasture area is repeatedly granted. The differences in the vegetation cover are pronounced: at certain times, some areas show only about 10 %, while others show close to 100 % cover. To avoid treading damage and soil compaction at the feeding site, the farm uses concentrates in large pellets and distributes these over the whole pasture area.



## Farm portrait

### Location

Schleswig-Holstein, Germany

### Topography

Flat, 13 m above sea level

### Farmland

600 ha: 460 ha of arable land and grassland

### Size of pig herd

50 sows and their offspring, as well as up to 120 growing-finishing pigs

### Farming system

- Pregnant sows are housed on the pasture in summer, on a concrete pad with huts in winter.
- Weaners and growing-finishing pigs are housed indoors with concrete outdoor run.





Weaners and growing-finishing pigs have access to an outdoor run.

## Animal welfare

Overall, clinical assessment reveals mostly healthy animals with only minor problems.

However, some of the weaners and growing-finishing pigs showed short tails due to necrosis during the suckling period, probably caused by mycotoxins. In addition, it's possible that sows on the pasture were lame, due to stones on the dry, hard ground. Sunburn was observed in individual animals. However, sun protection in the form of sails and wallows in the pasture reduces this risk. Skin lesions occur in all animal groups when new groups have been previously formed. However, the farm's aim is to keep groups as constant as possible, so serious injuries do not occur.

No stereotypical or aggressive behaviour can be observed in sows on pasture. Manipulation of other pigs or equipment in the pens was also not the dominant behaviour observed in the weaners and growing-finishers, but can occur very sporadically.

**Table 1: Productivity**

Productivity	Sow	
Average no. of litters / sow / year	2.1	
Average no. of piglets born / litter	15.2	
Average no. of piglets weaned / litter	10.8	
Average no. of litters / sow until culling	5.9	
Feed usage / sow / year [kg]	1,300 <sup>1</sup>	
Productivity	Weaners	Finishers
Average daily weight gain [g / day]	345	800
Feed conversion rate [kg / kg gain]	2.5	2.8
Environmental impact	Weaners	Finishers
GHGs <sup>2</sup>	5.23	4.64
Terrestrial eutrophication [molc N] <sup>3</sup>	0.22	0.154
Marine eutrophication [kg N] <sup>3</sup>	0.099	0.067
Water footprint [m <sub>3</sub> ] <sup>3</sup>	0.04	0.021

<sup>1</sup>concentrate + 760 kg grass-clover-silage + pasture

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

<sup>3</sup>per [kg live weight] weaned / finished Pig (full life cycle)

**Table 1: Animal welfare assessment**

Age group	Welfare parameter	Assessment during project period
Weaners	Short tails	No lesions detected, but short tails in some pens <33 % of all animals
Weaners	Runts	Only very few
Weaners	Lameness	Not detected
Finishers	Skin lesions (scratches)	In 1 pen >33%, because of new group composition
Finishers	Short tails	No lesions detected, but short tails in some pens <33 % of all animals
Finishers	Lameness	Not detected
Sows	Skin lesions (scratches)	Not detected
Sows	Shoulder lesions	Not detected
Sows	Swellings, lameness	No swellings detected, but <20 % of all sows showed lameness
Sows	Soiling	In winter: not detected; in summer: 85 % of all sows with <30% of the body muddy
Sows	Vulva lesions, deformations	Very few lesions detected; 10 % of the sows showed vulva deformations

## Environmental impact and productivity

- For pigs housed indoor, the indoor areas are cleaned as needed, and the runs are mucked out twice a week. There is no slatted floor. During the project period the majority of the pens had under 10 % of their areas soiled. Regarding the outdoor runs, very clean ones (<10 % soiled), medium-soiled ones (10–50 % soiled) and very soiled ones (>50 % soiled) were documented. This depended on both, the timing of mucking out and the weather conditions.
- The farm has a medium level of carbon footprint (greenhouse gasses = GHGs) in the breeding system at 5.23 kg CO<sub>2</sub> equivalents per kg of weaned piglet, and a higher level of footprint for the limited number of finished pigs produced, at 4.64 kg CO<sub>2</sub> equivalents per kg finished pig. Due to the extensive housed time, emissions from manure handling and storage are a significant source, with the remainder largely from feeds and building infrastructure. Due to the high level of feed self-sufficiency and closing of nutrient cycles the farm has lower than average eutrophication and water use values. The farm is also productive with 23 weaned piglets per sow per annum, and a finisher live weight gain of 0.82 kg per day.

## Labour and cost

- Three permanent employees and one trainee are employed to take care of the pigs. Their work includes the assessment of data for scientific experiments, as well.
- No work task is fully automatised. Washing of stables and equipment as well as feeding and new bedding are done by hand. The removal of manure and the moving of huts is done using machines.
- From the farmer's point of view, it would be desirable to combine the fattening capacities, which are spread over three locations, in one complex to optimise the work processes.
- It should also be mentioned that grazing is becoming more costly due to the risk of African swine fever and the associated need for double fencing but is considered so valuable that it should be maintained in any case.



## Take away lessons

- The combined indoor and outdoor housing system of pigs is very suitable on heavy soils, as year-round grazing is often not possible.
- Integrating seasonal grazing into the crop rotation has proven successful, as it avoids hygiene problems.
- Distributing concentrates in the form of large pellets over the pasture area protects the vegetation and avoids soil compaction at the feeding site.

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