

# Project *brief*

Thünen Institute of Organic Farming

2022/06a

## Optimization of piglet nest use under organic husbandry conditions

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- **Nest use increased from the first to the third day after birth. The piglet nest was used more frequently during the day than at night, and piglets spent significantly more time in the piglet nest in winter than in summer.**
- **Temporary confinement of piglets in the nest resulted in more frequent nest use.**
- **Different types of heating and lighting of the nest showed no clear effects on piglet nest use and piglet behavior in the nest.**
- **Floor heating used less energy than lid heating.**

### Background and aims

Although organic husbandry allows the sow to move freely and exhibit species-typical behaviors, suckling piglet losses can still occur. Most of these losses occur in the first days after birth and are due in roughly equal parts to crushing by the sow and weakness of the piglets.

The aim of the project was to optimize piglet nest use within the first three days of piglets' lives. The underlying hypothesis was that early and frequent use of the piglet nest would benefit piglet development by improving animal vitality by preventing chilling and by better protecting piglets from being crushed by the sow. Ultimately, this should improve animal welfare and the vitality of the piglets and contribute to reducing piglet losses, while using only little energy.

### Approach

The following measures were compared: Heating of the piglet nest with electric floor heating or an electric infrared lid heating, lighting the piglet nest with a small red LED light, or not, and confinement of the piglets in the nest during the first four feeding times of the sow after farrowing, or not. All eight possible combinations of measures (=variants) were tested. The piglet nests were equipped with cameras that recorded the first 72 hours after birth. The recordings were evaluated using a scan-sampling procedure with an interval of ten minutes. It was documented how many piglets were in the nest and whether they were active or resting in a heap or scattered position. Temperature on different spots within the nest, piglet weight gains, medical treatments, animal losses and energy consumption of the heating were also recorded.

In addition to the on-station trial on the experimental station of Thünen Institute of Organic Farming, eleven farms in different

German states were visited to gain an insight into the status quo of piglet nest design. For this purpose, the design and management of the piglet nests as well as general performance parameters were documented and farmers were asked how satisfied they were with their piglet nests.

### Results

The final data set of the on-station trial included data from 113 litters of 52 sows (parity 1-10) and 12-15 litters or 164-224 piglets per variant. Birth weights and daily weight gain were similar with other organic farms and few medical treatments were required. The average temperature in the nest was between 23 and 32 °C. The lid heating provided higher average temperatures (29 °C) than the floor heating (25 °C). However, due to the technical differences between infrared and electric heating, it remains unclear whether these measurements accurately reflect the temperature perception of the piglets. However, considerable differences were measured with regard to the energy requirements of the two heating systems. With 18 kWh, the lid heaters required exactly twice the amount of energy as the floor heaters with 9 kWh during the test period.

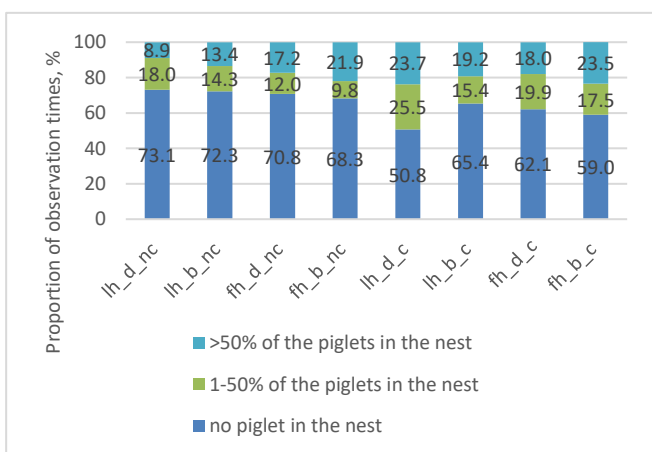
Descriptive analysis of the data revealed differences in nest use between the variants. Litters of variants with piglets confined to the nest showed significantly higher proportions of observation times with piglets in the nest than variants without piglets confined. The type of heating and the presence of light had no clear effect on nest use. Nest use was also influenced by piglet age, time of day, and season.

As far as the behavior of the piglets in the nest is concerned, no clear differences could be found between the variants. However, the age of the piglets had a clear influence here as well. During the day, the piglets showed more active behavior

than during the night, and with regard to the seasons, it was noticeable that resting in scattered position occurred more frequently in the summer than during the rest of the year.

Despite the increased nest use due to confinement, none of the measures studied affected the frequency of piglet losses. The losses within the first three days p.p. ranged from 10.5% in the variant with floor heating, without lighting and without confinement to 18.6% in the variant with lid heating, without lighting and with confinement.

It can be summarized that nest use and behavior of suckling piglets in the first three days of life are subject to the influences of piglet age, time of day, and season. However, neither the location of the heat source nor the presence of a light source in the piglet nest had any effect on nest use or piglet behavior. Repeated temporary confinement of piglets in the nest increased its use, but no direct relationship to piglet losses was found. Possible explanations for this could be the relatively small number of litters per variant or that the effect of the piglet nest was not relevant enough to influence the multifactorial event of piglet loss occurrence.



**Piglet nest use by variants** (with lh=lid heating, fh=floor heating, b=light on, d=light off, nc=without confinement, c=with confinement)

Source: own representation (2020).

The farm visits showed a diverse picture with regard to the design of the farrowing pens and the piglet nests. Positioning at the front of the service aisle and the use of straw as bedding were widespread and seem to have proved their worth. The piglet nest was heated on all farms, either using lid heating only or a combination of lid and floor heating. Short-term confinement of piglets in the nest as a management measure was practiced only on some farms and sometimes only irregularly. Piglet losses varied greatly between the farms and sometimes reached a considerable level of over 30%, which underlines the need to find options to reduce piglet losses.

The interviewed farmers made various suggestions for improvements in piglet nest design, ranging from automated climate control in the nest, improved visibility for animal control and optimization of the separation of the nest from the sow's lying area, to the short-term removal of bedding to improve the accessibility of the nest for newborn piglets. From the discussions, it was evident that despite predominant satisfaction with the piglet nest, there is definitely room for improvement and the farmers are actively interested in this.



**Piglets use the piglet nest as a safe resting area**

Source: own picture (2020).

### Recommendations

The present work provides valuable basic findings from which no immediate recommendations for practice can yet be derived, but further research needs can be formulated. For example, due to the clear positive effect of temporary confinement of the piglets in the nest on nest use, a more detailed investigation of this measure seems to be needed.

## Further Information

### Contact

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DOI:10.3220/PB1644312332000

### Partners

BOKU (AT), INRAE (FR), WUR (NL), AU-AGRO (DK), UHF (DK), RISE (SE), CREA-ZA (IT), FiBL (CH)

### Duration

5.2018-11.2021

### Project-ID

1995

### Publication

Heidbüchel KL, Baldinger L, Bussemas R (2020) Behavioural observations of sows and piglets in a free farrowing pen with a focus on the piglet nest. In: Organic Animal Husbandry systems - challenges, performance and potentials: Proceedings of the IAHA Video-Conference on Organic Animal Husbandry, 21. and 22. September 2020. pp 109-110

### Support

