

# Assessment of Innovative Pig Fattening Methods within the framework of a Field Study

## Results on Ethology and Functional Reliability

*In a field study four innovative pig fattening systems were tested in five stables per system. The ethological investigation was focussed on direct animal observation and integument scoring with the „Ekesbo“ method. The results show that the individual farms have a strong influence on animal welfare and system reliability, which can even exceed the expectations from the system.*

Since the middle of the nineteen-eighties exist several new innovative concepts for naturally ventilated pig-fattening systems in Southern-Germany. Also with conventional systems improvements had been in terms of slot reduced laying areas, structuring of the pens and occupational offers. The aim of this project is, based on a broad farm-study, to compile significant results for animal welfare within these housing systems as well as on functionality of the single systems.

### Animals, Material and Methods

The experimental design of the whole study, in particular the ethological investigations were described in detail in LANDTECHNIK-Net 5/2004 [1] as well as in ATF 10/2004 [2]. Altogether four pig fattening systems each integrated with five stables had been investigated for several parameters for a one yearis period. The year was divided into four blocks, parallel to the seasons, to ascertain any seasonal effects. The single systems were composed of conventional stables with slot reduced laying area, sloped floor stables with minimal littering, open front units with sleeping boxes as well as stables

with exercise yards and straw littering. Each farm had been investigated in each experimental block for two successive days (compensation of the daily effect). The distribution of the systems as well as the particular farms within the block periods had been selected randomly.

The soiling score for every single functional area had been done with help of the „five marks method“ [3]. The rating 0 had been assigned when the whole area was clean and dry, the mark 1 when 0 to 25 % had been defecated or wet, the mark 2 with 25 to 50 %, the mark 3 with 50 to 75 %, and the mark 4 with 75 to 100 % defecation or water spilling.

The presented results are descriptive, the final statistics with significance tests will be presented in further publications.

### Results

With the analysis of the question how far the animals are able to structure their particular pen within the single housing systems, the results from the already published part of the investigation were ascertained [1, 2]. The total laying time for all functional areas was in

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The investigations are funded by the Ministry of Nutrition and Rural Areas Baden-Wuerttemberg.

### Keywords

Pig-fattening, animal welfare, functional pen areas

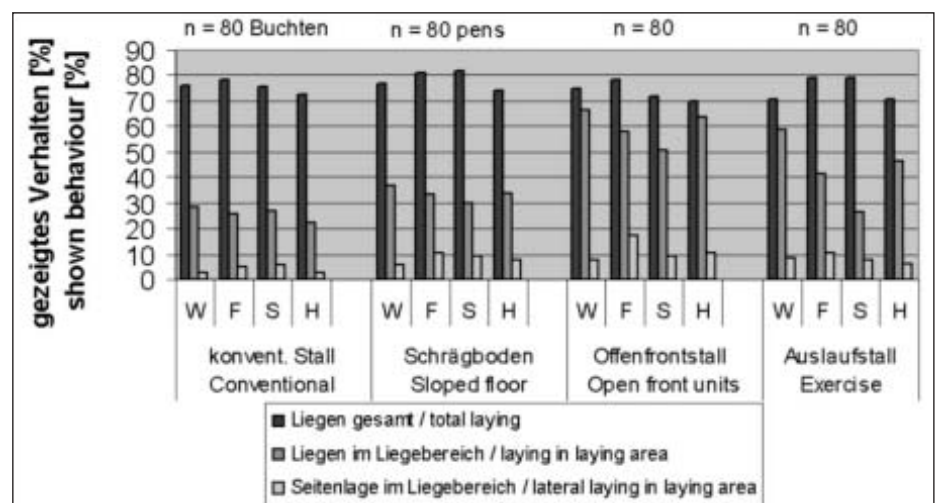


Fig 1: Acceptance of the laying area in the investigated housing systems in the course of the year (W= winter, F= spring, S= summer, H= fall)

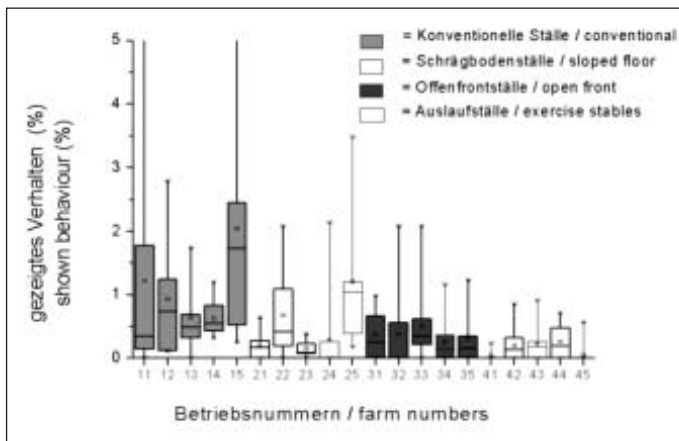


Fig 2: Shown abnormal behaviour on farm level

an annual mean with all systems included between 75 and 79 % and thus is therefore approximate the same. There is a trend that in the sloped floor and in the conventional systems, the pigs laid most frequently. However the choice for the occupied functional areas had been strongly different. The laying area in the open front system was used with a frequency of 60 % during the observation period as well as the stable with exercise yard with 43 % partly with the double frequency of utilisation as the laying areas in the conventional system with 26 % and in the sloped floor system with 33 %. But it has to be admitted that in a few stables from the group conventional system with slot reduced laying area the laying area with its 30 % share was about 5 to 10 % smaller than in the compared systems. However this is because of the common practice a characteristic of this system. If this result of the whole year is differentiated for the single seasons, the result is similar. In Figure 1, it can be recognised that in the conventional as well as in the sloped floor system there are barely seasonal variations concerning the acceptance of the laying area. In the open front stables this acceptance decreased during summer down to 51 % (in comparison: winter 66%); but it had been nearly on the double level compared to conventional stables. Still clearer was this summer decrease in the stables with exercise area. In summer the animals preferred the exercise area for laying and per definition in this study, there was no laying area. So the results from the parameter structuring the pen clearly favoured the systems with segregated climatic areas.

Concerning the parameter lateral laying over all functional areas which is an indicator parameter with limitations for the total relaxation of the animals [4], the systems with straw littering showed in tendency the highest values; however the variance of this parameter was quite wide. Similar was the investigative-behaviour „rooting in total“ (aggregation of the parameter „rooting on the floor“, „in faeces“, „in muck“, „in

straw“). Also here the stables with straw littering showed with a mean value of 8.6 % shown behaviour during the observation period the higher values compared to the other stables (mean value 6.9%). The aggregated parameter shown abnormal behaviour (tail and ear biting, blank munching, bar biting) is very important for the assessment of a husbandry system, because it is an abnormal behaviour, not characteristic for the species, and mostly being caused by deficiencies in environment. In principle it must be stated that in this study in contrary to common practice, only valorised systems had been included. According to this the occurrence of abnormal behaviour was on a low level, however there had been single farms being concerned stronger. The mean value for the conventional system with slot reduced laying area was 1.1 % showing abnormal behaviour of total behaviour during the observation period (but with a high variance). The sloped floor- as well as the open front stables were with a mean value from 0,5 % respectively 0,36 % in a similar range. The fewest abnormal behaviour showed up in the stables with exercise areas and straw with a mean value of 0.15 %.

From Figure 2 it is clearly visible that within the systems there can be big individual differences between the single stables. There were conventional stables which had comparable results like stables with „alternative“ housing systems. This shows the clear influence of the particular stock management and of the pen structure on animal welfare. So two sloped floor stables had relatively bad results, in stable 22 the ammonia concentrations in the stable air had been increased because of a ventilation rate too low and farm 25 offered only minimal or no straw quantities.

The assessment of the hind legs showed that in systems without straw littering there occurred more joint swellings. It had been ascertained joint swellings and bursa extensions in the conventional system with 74 % as well as in the open front stable with 70 %

from all judged hind legs. In contrast, from all hind legs in the sloped floor stable only 58 % as well as in the stable with exercise area only 55 % had joint swellings. Surprisingly this parameter occurred in general quite frequently in all systems.

By scoring the pen soiling in the course of the year only small variations were found. Analogue to the acceptance of the laying area it was the case with its soiling too. In the mean this had been soiled strongest in the conventional stable ( $x = 1.16$ ) as well as in the stable with exercise area ( $x = 1.1$  on a scale from 0 to 4). However the reasons in both systems were different. Was it in system I more the reduced acceptance of the laying area, it was in system IV more the type of the dunging system. An explicit lower soiling of the laying area showed the sloped floor stable with an annual mean of 0.59 as well as the open front stable with 0.54. Amazing was the average annual constancy and therefore the functional reliability by these systems, anyhow strong farm individual differences existed too.

## Conclusion

For all investigations the strong farm individual influence on animal welfare in the single systems had been shown, which could even exceed the average system effect. Straw offers reduce abnormal behaviour and lead simultaneously to less damages at the hind legs. In systems with segregated climatic zones the functional areas will be better accepted by the animals. However there were conventional farms, which had partly comparable results like the alternative farms. The functional reliability in the course of the year was granted in the mean by all investigated systems, but with farm individual differences.

## Literature

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