

Gesamtheitliche Beurteilung innovativer Schweinemastverfahren für Baden-Württemberg

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Summary:

Within the field of animal finishing the consumers' demands on ethic aspects regarding the keeping conditions and housing systems increase. Especially the fattening of pigs is strongly criticized due to its intensity, concurrent the farmers are confronted with rising production costs and decreasing sales revenues. The field study in hand comparing different fattening pig production systems investigates how animal welfare, a "high" profitability and a high consumers' acceptance can be combined in innovative housing systems.

The following forward-looking housing systems were investigated: Improved conventional system with reduced slots in the lying area and occupation technique, sloped floor system with minimal litter, open front stable with resting boxes and litter systems with outdoor exercise yards. Five stables on practical farms per housing system category were investigated over a period of one year. A well-grounded basis for the data analysis was achieved with four repetitions of the measurements per farm respectively twenty repetitions per housing system. Investigation parameters were animal welfare aspects, operational reliability, work requirement per animal place, building costs and consumers' acceptance.

Animal welfare aspects were examined by means of direct behaviour observation, integument scoring with as well registration of stable related additional functional and climatic parameters. The transcription of the animal behaviour was carried out with the scan-sampling method. A mobile video equipment for the field was developed, which supported the observation of non visible pen areas and an own registration software (ETHOSCAN 04) was programmed. The use of the software on robust tablet computers lead to a standardized data recording procedure and prevented from transcription errors. In order to standardize the integument scoring a predefined picture catalogue was set up. The data recording was additionally objectivised by means of comparative tests between the different observers and judges, which resulted in high ($r = 0,89$; direct observation) respectively medium ($r = 0,65$; scoring) correlation coefficients. The operational reliability of the housing system was assessed via scoring of the pen soiling and the measurement of indoor air quality parameters. The work requirement was documented in working log books, the building costs were calculated according to DIN 276. A questionnaire was answered by 249 grammar school teachers as consumers. All results flow together in an integrated overall evaluation. The final analysis of the behaviour observation and integument scoring was done with a mixed effect model.

The results can be hold down as follows: The acceptance of the lying area in housing systems with separate climatic areas (open front stable 82,07%, outdoor exercise stable 62,64%)was twice as good as in systems with an uniform climate area (improved conventional system 31,39%, sloped floor system 43,94%).

A higher quantitative and qualitative exploration behaviour "rooting" was exercised in housing systems with straw litter, whereas a more frequent treatment of the pen equipment and offered occupation technique in systems without straw was observed. Behavioural disorders were found declining from conventional systems (4,91%) to sloped floor systems (3,1%) to open front stable (2,34%) to outdoor exercise stable (2,26%), but on an altogether acceptable level. Less pathophysiological changes respectively injuries at the extremities thus lamenesses were detected in pens with straw litter compared to systems without straw, which underlines the absorbing protective function for the extremities of already small amounts of straw. Notwithstanding these bodily changes existed across all housing systems on a high level. A significant increase of the parameter "changes at the tail" is associated with a reduced net pen floor area per pig. All parameters to evaluate the animal friendliness of the housing systems were strongly influenced by the individual farm, thus the farm effect was partly higher than the effect of the housing system.

In the course of the year the cleanness of the lying areas of nearly all stables was satisfactory, the highest risk for an utilisation reversion of the functional areas existed in the summer months for the outdoor exercise stable. The indoor climate measurements gave for the hydrothermal complex in nearly all stables acceptable levels. During the autumn months especially in insulated stables relative high indoor air ammonia concentrations (> 20 ppm) occurred. The measurement of the illuminance revealed, that nearly no insulated stable met the legal requirement of 80 lux during 8 h (animal welfare-productive livestock ordinance, 2006).

The calculated building costs per animal place (1,0 m²/pig each) amounted to 611€ for the improved conventional system, to 513€ for the sloped floor system, to 447€ for the open front stable and to 423€ for the outdoor exercise yard stable. For a conventional animal place according to animal welfare productive-livestock ordi-

nance (2006) with a required minimum floor space of 0,75m²/pig were building costs of 458€ calculated. The work requirement per animal place was higher in systems with straw litter (sloped floor system 1,42 APh, outdoor exercise system 1,76 APh) compared to systems without straw (conventional stable 0,98 APh, open front stable 0,81 APh). These differences were though mainly caused by workings independent from the housing system.

The assessment of the animal friendliness of the housing systems is overriding for the overall consumers' judgement. They prefer stables with exercise yards respectively near to outdoor conditions. Slotted floor is not directly rejected when it is embedded in an integrated animal friendly concept. The donation of small amounts of straw respectively the offer of occupation techniques were not recognised as to their ethological importance. Further research has to be done particularly in a cause analysis for the in all systems accumulate occurrence of thickened joints at the extremities of the pigs. Probably there can be found a remedy with floor materials which also can be installed with operational reliability.

In view of the investigated question aim in this study, the outdoor exercise yard stable as well as the open front stable achieve in the final overall evaluation the highest rank with the digit of 1,9 closely followed by the sloped floor stable with the rank digit of 2,5. For the improved conventional stable a rank digit of 3,7 was determined. In the whole study the individual farm effect on the potential of the respective system became obvious.

In summary all investigated stables in this field study with good construction work, pen design and corresponding animal care and marketing management were acceptable concerning animal friendliness, operational reliability and economics. Depending on the definition of requirements it has to be decided individually which pig housing system is the most suitable for a single farm.

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