

Housing Sows in Farrowing Crates with Straw Racks

Piglet Behaviour and Growth

The influence of straw racks on behaviour of piglets in the farrowing area was tested. The ten conventional farrowing pens of one compartment were equipped with two straw racks each, one for the sow, the other for the piglets. In another identical compartment, sows and piglets were housed without straw. After two weeks of age, piglets made use of the straw, especially in the mornings and afternoons; during the remaining time they hardly showed any interest. Straw racks have no effect on piglet growth. Piglets weight gain is significantly influenced by the random effect of the sow, litter size and birth weight.

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Keywords

Piglets, behaviour, straw racks

Increasingly the modern pig housing is caught in a conflict between economical coercions and concerns of animal welfare. Though housing sows in crates without straw on a slatted floor is distinguished by an environment with sparse stimuli, most of the sows are still reared in those housing systems. Therefore, it makes sense to test every enhancement of housing conditions for sows in conventional farrowing crates. Since the usage of bedding material on a slatted floor is not possible, the use of straw racks could be an appropriate alternative. In the following the acceptance of straw racks by piglets is determined on their first three weeks of life. Furthermore, the influence of straw racks on piglet's growth is examined.

Housing conditions

The investigations were carried out on a gilt multiplying farm of the “Bundeshybridzuchtprogramm”. The herd includes 120 productive sows with a remotation of 50 %. Gestating sows are housed in crates without straw. Possibilities for locomotion are granted alternately. The farrowing area is built into a compartment house with four compartments which are constructed in the same way. Each compartment contains ten farrowing pens with the same size of 1,80 m • 2,20 m. Within these pens sows are restrained diagonally in a crate.

The farrowing pens are equipped with a slatted floor; the nest for piglets is made of polymer concrete and is stoked with a gas thermae. Each compartment is force ventilated separately by the negative pressure method.

The feed distribution is conducted via pipe chain with volume dosing devices for each sow. The sows are fed twice a day, at 7 a.m. as well as at 6:00 p.m.

Experimental design

For this trial one farrowing compartment with ten farrowing pens is available. Every pen of this compartment is equipped with two straw racks each, one for the sow, the other for the piglets. Automatic feeders



Fig. 1: View of the straw rack for piglets

made of stainless steel are used as straw racks for piglets. The front of these feeders is disconnected and provided with movable iron bars. By moving these bars with their nose piglets can gather straw from the rack, which is offered ad libitum (Fig. 2).

Collecting and analysis of data

The farrowing compartment was controlled via video cameras, to obtain the utilisation of the straw racks and the behaviour of the piglets on four selected observation days. Activities in front of the racks are observed over a 24-hour period on piglets' 1st, 7th, 14th and 21st day of life. Time and number of piglets in front of the rack were registered continuously.

Of three retries the growth data of piglets housed with racks were compared with those of piglets reared without straw. On their first day of life piglets were weighed individually. The second weighing takes place on day 21. Piglets' losses as well as number of live and stillborn piglets were registered.

Altogether growth data of 420 piglets from 52 sows were taken into consideration. Analysis of variance is carried out (proc mixed, SAS Institute Inc. 2001). The housing system, sex, litter size and birth weight are considered as fixed effects; the sow is included as a random effect.

Occupation with the straw racks

The interest of 200 piglets in the straw racks on four observation days was recorded. However, one and seven day-old piglets showed hardly any interest in straw racks, so

that these two observation days will be disregarded in the following report of the results.

Both on day 14 and on day 21 the number of piglets occupying the straw rack was registered continuously. Altogether, on day 14 piglets visited the racks 987 times, on day 21 the number of visits amounted to 1296. On average, 14 day-old piglets visited the racks five times and 21 day-old piglets 6,5 times a day. The distribution of rack visits depending on time-of-day is characterised by similar forms of the curves (fig. 2).

A clear rise of rack visits was registered between 6.00 and 9.00 a.m. The peak of this rise can be found between 7.00 and 8.00 a.m. At this hour the number of rack visits amounts to 179 with 14 day-old piglets and 203 with 21-day-old piglets. A second rise can be detected in the afternoon between 4.00 and 9.00 p.m., with its peak between 5:00 and 6:00 p.m. However, the afternoon rise does not reach the activity level of the mornings, but it lasts a longer bout of six hours. At midday and at night piglets show hardly any interest in racks. By means of these curves clear activity and rest periods can be determined, whereas the older piglets visit the racks slightly more frequently. Both activity peaks correspond with the feeding times of the sows, which are an important timer for the rhythm of the day [3].

In an environment with sparse stimuli, piglets show a conspicuous manner satisfying their exploration behaviour [4]. According to [5], piglets look for other piglets as substitute objects and bite, nibble and gnaw each other. These attitudes are difficult to overcome during the fattening period and they can cause serious injuries [5, 7]. The activities of piglets on day 14 and 21 show that usage of straw racks demonstrates an attractive improvement of the environment.

Growth of piglets

The random effect of sow, which estimates the different individual attributes, significantly

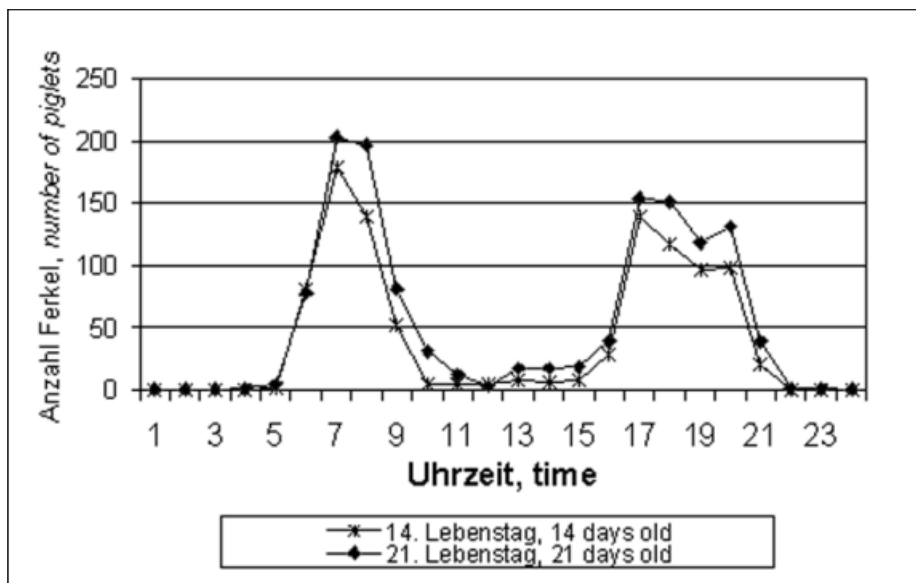


Fig. 2: Number of piglets being engaged with the straw rack, depending on age and time of the day

cantly influences the weight gain and the total weight on day 21. The usage of straw racks does not significantly affect weight gain and the weight on day 21 (Table 1). Furthermore, weight and weight gain are also influenced by litter size as well as by birth weight. However, [1] found in their studies, that litter influences piglets positively. They observed higher weaning weights and higher weight gains as well as less piglet losses. [5] studied the usage of straw racks with sows housed individually in a farrowing pen without confinement. They also found higher weaning weights, compared to piglets housed without straw. In this study a significant influence can be collated to the litter size. Piglets from smaller litters gained more weight than those born in litters with ten and more piglets. This difference can be ascribed to better suckling conditions for piglets from smaller litters. In addition, the birth weight also affects weight gain. [2] reported earlier that piglets with higher birth weight gain more weight.

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Table 1: Least square means (LSM) and standard error (SE) of weight and weight gain on day 21, depending on housing system, litter size and birth weight

	Housing System		Litter Size		Birth Weight		
	Strohlos	Raufen	< 10 Ferkel	≥ 10 Ferkel	< 1,5 kg	1,5 kg – 1,9 kg	> 1,9 kg
N	190	230	186	234	115	285	210
Weight gain							
LSM	5,78 ^a	5,62 ^a	6,08 ^a	5,31 ^b	5,09 ^a	5,75 ^b	6,25 ^c
SE	0,21	0,20	0,19	0,21	0,18	0,15	0,16
Weight							
LSM	7,44 ^a	7,32 ^a	7,79 ^a	6,97 ^b	6,40 ^a	7,45 ^b	8,30 ^c
SE	0,21	0,20	0,19	0,22	0,19	0,16	0,16

a,b,c: LSM with different letters are significantly different.