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A Circular Farrowing Crate which makes it Possible to Confine Sows during the First Postpartum Days

Circular crates in the farrowing compartment promise positive effects on the well-being of farrowing sows. Crushed piglet losses are significantly higher in locomotion crates than in conventional rectangular crates. Investigations with a circular crate showed that crushed piglet losses were only observed during the first 48 hours postpartum [2]. To avoid these crushing losses, in a following trial the sows were confined during these 48 hours and afterwards released again. The positive effects of this locomotion crate should be exploited and piglet losses reduced.

Fig. 1: Circular crate with piglet nest and fixed sow during 48 hours post partum

For keeping of breeding sows in the farrowing compartment, the conventional rectangular crate with permanent fixation of dams and slatted floor has been established as standard system for an economic pig production since the seventies.

The conventional rectangular crate aims on reducing piglet losses [1], working time and the risk of injury for the livestock worker.

In contrast, restriction of movement is often a problem for animal well-being, because of increasing occurrence of behavioural disorder. But animal welfare is increasingly demanded by the consumers. By the fact that fixation of the sow in the farrowing compartment is already forbidden in certain countries, it is assumed that the existing EU-Directive will be amended in a few years, so practicable alternatives for the existing keeping system should be available then.

The present investigations are based on a circular crate, modified by the Chair of Agricultural Systems Engineering, which was already tested in the year 2005 at the experimental station Thalhausen (TU-Munich). In this trial it was shown that sows kept in a circular crate could live out a wide spectrum of species-specific behavioural patterns [2]. While in the conventional rectangular crates (18 control sows) only 0.5 % of piglets were crushed, with 7.9 % for the test sows (18 test sows) in the circular crates it was (18 test sows) considerably higher. However, crushed piglet losses were observed only during the first 48 hours postpartum. For this reason circular crates were again modified and a following trial has been carried out.

Material and method

In three farrowing compartments - altogether six test crates -with the dimensions 2.2 • 2.4 m, beside six crates with conventional rectangular crate conditions, were installed. The rear part is pin-jointed with the front part, so this can be opened for stalling in or stalling out of the sow. Additionally, four different floor options were tested concerning animal hygiene and work management. In the first option, the floor was cover 2/3 with a rubber mat; the second has the mat only in the area of the piglet nest and in the third a small mat in the centre of the circular crate. In the last floor option no mat was laid out. In three batches, the behaviour of sows was recorded on fixed days by video cameras. From the entire stay of sow in the farrowing stable, following phases were distinguished: keeping in the crate, fixation (including nest-building 48 hours ante and postpartum) and free movement (from 48 hours postpartum, which means removal of fixing holder).

As results of behavioural analysis in keeping, nest-building and immediate birth

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Keywords

Breeding sows, farrowing crates, circular crate, animal behaviour, reproduction parameters

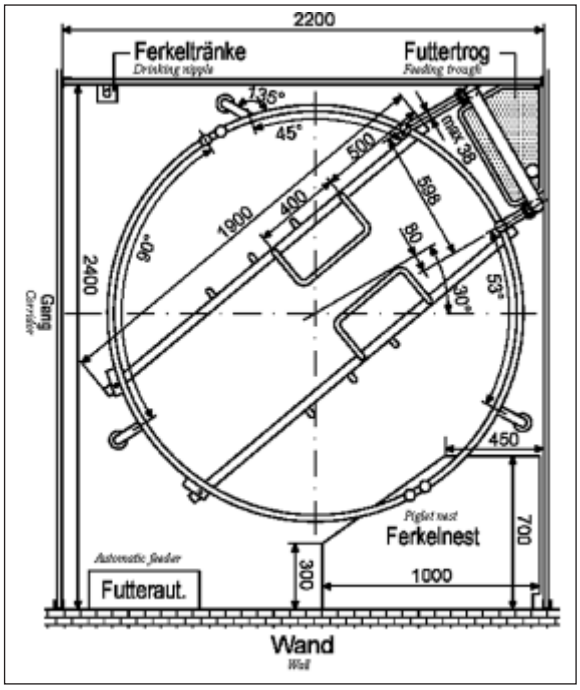

Fig. 2: Ground plan of the circular crate

phase did not present other results compared to the first trials in 2005 [2], further analysis were not made on it, as well as on the nursing phase, and the focus was on the fixation and birth phase 48 hours after birth.

Results and discussion

Animal behaviour

Changes in behaviour were at time of birth quite low and increased first after birth. Increased activity could be observed especially before and after suckling in the free movement phase. Behavioural analysis of the first trial (2005) showed that dams in conventional rectangular crates are spending more time sitting. This can be approved partially by the actual investigation. The entire sitting time in the observation period is higher for circular crate sows; the duration for the behaviour type "sitting" is higher for the sows kept in conventional rectangular crates. The test sows showed the behaviour type "sitting" more often, but with shorter duration. The behavioural pattern of "standing" shows a similar situation. Test sows showed this behavioural pattern more often, overall longer, but per behaviour shorter. Due to more changes in behaviour, a higher activity of circular crate sows compared to the control animals in the conventional rectangular crate could be detected again.

In the fixing phase, which means the time antenatal, in all sows prone position dominate compared to lateral position. After the birth, all sows spend more time lying in lateral position than in prone position. The average duration of lying phases is in fixation as well as in free movement phase higher in control sows than within the test sows. Consequently an overall higher activity of test sows in the circular crate can be concluded. The most frequently shown behaviour of all sows during fixation is exploration behaviour ("rooting, nuzzling, chewing and biting"), while test sows showed this behaviour more often than control sows.

This fact is probably due to the fixing phase, where the test dams find a new environment by the fitting of the fixing holder and the following limited movement freedom.

Reproduction parameter

The loss level is with 2 % for the control animals in total at a very low level, compared with 4.9 % as a mean value of the last year at the experimental station. In general, the experimental station is definitely superior to the average of German piglet producers (16 %) [3].

The total losses of 5 % of the circular crate are on an acceptable level in a nationwide benchmarking. By the fixing the test sows during the first 48 hours postpartum piglet losses have been reduced about more than 3 percentage points compared to 2005. But crushed piglet losses were still about 3 % higher than in control crates, resulting in lower profit of 64 € per sow and year, when comparing full costs compared to the conventional rectangular crate.

Animal hygiene

Through a high fouling level, a higher cleaning effort by the serving personnel is necessary. Furthermore, fouling causes hygiene problems e.g. for the sow's teats.

It is essential to keep the fouling level as low as possible. The pen with slatted floor has done well respective fouling, but has to be regarded critically, concerning ethological and legal framework. Furthermore on option 3 the floor design has been evaluated as positive.

Conclusion and outlook

Fixation of sows in a circular crate about birth time allowed reducing piglet losses about 3 percentage points, compared to a circular crate without fixing option. It has to be considered that the loss level of loss was in control sows with 2 % at an extremely low level, too. The circular crate is a clear improvement for the sow concerning animal welfare, but actually it is an economic compromise, which can be -while doing further improvements – an alternative to the conventional rectangular crate.

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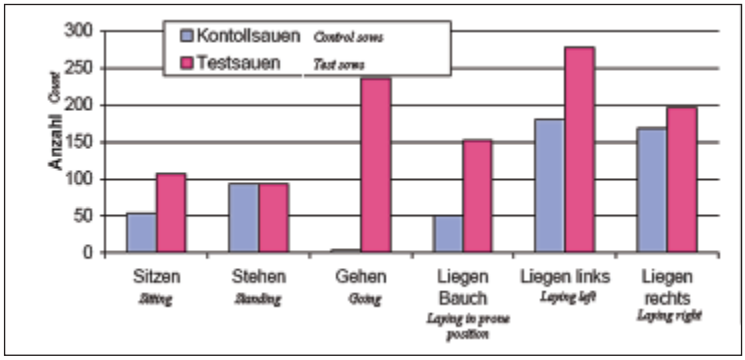

Fig. 3: Number of behavioural traits in the locomotion phase (circular crate vs. traditional rectangular crate)