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Effect of sow confinement versus non-confinement during farrowing and lactation on pre-weaning piglet mortality

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Due to its success at reducing piglet mortality, the farrowing crate is currently the most common form of housing used for sows during farrowing and lactation (Barnett *et al*. 2001). However, there is increasing concern that the restrictive environment of the farrowing crate which prevents the sow from performing natural behaviours has negative welfare implications (Barnett *et al*. 2001, Wechsler and Weber 2007). Confinement-free housing systems have the potential to improve sow welfare and are therefore being investigated as an alternative to the farrowing crate. However a reduction in sow confinement is commonly associated with an increase in piglet mortality, primarily due to crushing by the sow. The majority of pre-weaning piglet mortality occurs within the first few days post-partum, leading to the suggestion that a short period of sow confinement during this critical period may effectively reduce piglet mortality in confinement-free housing. Therefore, the aim of this study was to determine the effect of different periods of sow confinement during farrowing and lactation on pre-weaning piglet mortality.

One hundred and eighty multiparous sows were housed in either a conventional farrowing crate (1.7 x 2.4m) or a swing-side pen (2.8 x 2.15m). Sows housed in the swing-side pen had the pen open or closed during farrowing and then opened on either day three or seven of lactation. When the swing-side pen was closed it confined the sow and when it was open the sow had enough room to turn around. Piglet mortality and causes were recorded from farrowing until weaning. Piglets with visible signs of crushing were determined as 'overlay'. Any piglets with no visible signs of crushing were recorded as 'other'. Piglet mortality during the first 24h after birth was determined as a percentage of live born piglets. Piglet mortality after the first 24h was determined as a percentage of piglet number after litter equalisation. All analyses were performed using SPSS, v.21 and data expressed as means ± standard error of the mean. Piglet mortality was analysed as a trait of the sow using a general linear model, with treatment and block as fixed effects and parity as a covariate. Results considered significant at $P < 0.05$.

Total piglet mortality in the first 24h was significantly higher in sows that farrowed open compared to sows that farrowed closed or in a farrowing crate (13.2 ± 1.40 vs 7.4 ± 1.41 vs 9.4 ± 1.28% respectively). Piglet mortalities due to overlay in the first 24h were significantly higher when sows farrowed open compared to closed or in a farrowing crate. Total piglet mortality from day three to seven of lactation was not different between treatments. The incidence of overlay induced piglet mortalities was significantly higher when the swing-side crate was open on day three compared to seven and the standard farrowing crate treatment. The incidence of piglet mortalities from day eight to weaning was similar for all treatments.

In conclusion, the current data demonstrated an increase in live born piglet mortality when sow confinement during farrowing was removed, and higher incidences of piglet crushing when confinement was removed on day three post-partum. These data demonstrated that while farrowing crates may not have benefits in regards to piglet survival after day seven post-partum, piglet survival may be highly dependent on sow confinement during farrowing and the first week post-partum.

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Wechsler, B. & Weber, R. (2007). *Animal Welfare* **16**, 295-307.