

Behaviour and performance of suckling gilts and their piglets in loose single housing

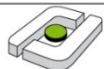
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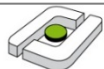


- Single housing and full time crating is the typical system during farrowing and suckling
- Single housing is in accordance with the needs of a sow around farrowing (von Borell et al., 2002)
- Fixation in crates is not in accordance with animal welfare during suckling (Baxter et al., 2011)
- Short time crating could be an alternative to full time crating (Bünger, 2002; Weber et al., 2009)
- Suckling duration was similar in single and group housing (Bohnenkamp et al., 2013), this could be true for short time crating

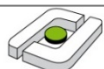


The aim of the present study was

to evaluate suckling performance and behaviour
of gilts and piglets
in two different single housing farrowing systems
under practical conditions

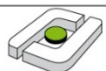
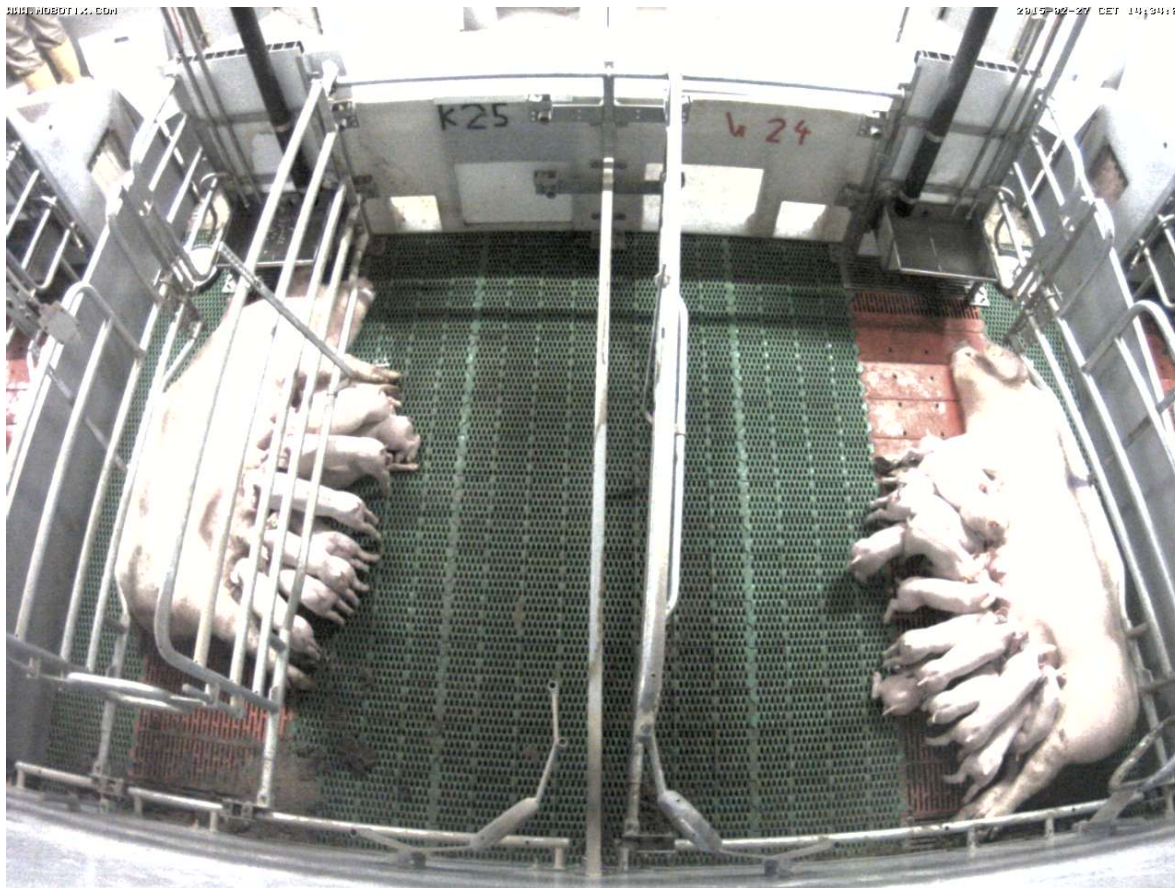


- Newly built barn for 550 sows in the northern part of Germany
- Trial period from February to May 2015
- BHZP-Viktoria gilts mated to db77-boars
- Control group: full time crating (FTC), conventional single housing with 6 farrowing crates, fixation from 48 h prior to farrowing till weaning (Pro Dromi[®] 1)
- Trial group: short time crating (STC), conventional single housing with 6 farrowing crates, short time crating fixation from 48 h prior to farrowing till 6th day of suckling (Pro Dromi[®] 1.5)



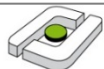
Material and methods

Figure 1: Single housing with full time crating (Pro Dromi[®] 1, left hand) and short time crating (Pro Dromi[®] 1.5, right hand)



Material and methods

- Single pens were identical in construction with an area of 6.5 m² in total, moving area of the gilt was 3.3 m² (STC) and 1.3 m² (FTC), respectively
- FTC 6 pens and STC 6 pens; 6 batches each; gilts entered pens 5 days before farrowing and for 3 days they were not fixated
- In each pen a jute bag (1.2m x 0.6m) was provided to allow nest-building behaviour
- During the first few sow feeding times piglets were fixated in their nest to reduce losses due to crushing
- Performance data of 70 gilts (1st parity) and behavioural observations of 17 gilts could be analysed
- Behavioural parameters were recorded on video on the following days: -1, 0 (farrowing), +1, +5, +7, +16



Statistical model of the piglets performance traits

$$Y_{ijklm} = \mu + H_i + B_j + S_k + b (W_{ijk} - \bar{W}) + e_{ijklm}$$

Y = observation

μ = sample mean

H = fixed effect of housing system (FTC, STC)

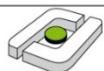
B = fixed effect of the batch (1 to 6)

S = fixed effect of the piglets sex (male, female)

$b (W_{ijk} - \bar{W})$ = linear covariate of piglets birth weight

e = residual random error

The model of the traits of gilts performance included the fixed effect of housing system only.



Mean (SD as index, minimum and maximum in parenthesis) for fertility traits of gilts

Trait	FTC	STC
Number of gilts/farrows (n)	37	33
Piglets born alive (n)	13.2 _{4.0} (3-20)	13.9 _{3.6} (4-21)
Piglets born dead (n)	0.9 _{1.4} (0-6)	1.1 _{1.3} (0-5)
Losses of piglets (n)	1.4 _{1.4} (0-4)	1.6 _{1.4} (0-5)
Losses of piglets due to crushing (n)	0.6 _{0.9} (0-3)	0.6 _{0.9} (0-3)
Losses of piglets (%)	9.8 _{9.3} (0-28.6)	10.2 _{9.0} (0-29.4)

^{a,b} significant differences ($p \leq 0.05$)

LSQ-mean (SE as index, minimum and maximum in parenthesis) for growth traits of piglets

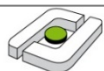
Trait	FTC	STC
Number of piglets (n)	432	410
Daily gain (g/d), 1st week p.p.	158 _{2.3} (-53-358)	153 _{2.4} (-100-333)
Daily gain (g/d), 2nd week p.p.	212 ^a _{2.1} (36-360)	223 ^b _{2.1} (34-423)
Daily gain (g/d), 3rd week p.p.	214 ^a _{2.6} (-2-408)	225 ^b _{2.6} (4-436)
Total daily gain (g/d)	199 ^a _{1.7} (46-329)	205 ^b _{1.8} (32-344)

^{a,b} significant differences ($p \leq 0.05$)

LSQ-mean (SE as index) for behaviour of gilts

Trait	FTC	STC
Number of gilts (n)	8	9
Lying (side, %)	57 _{1.9}	55.9 _{1.7}
Lying (belly, %)	22.5 _{1.5}	23.4 _{1.3}
Sitting (%)	5.8 ^a _{0.6}	4.0 ^b _{0.5}
Standing (%)	14.7 _{1.0}	14.8 _{0.9}
Walking (%)	-	1.9
Suckling (%)	29.8 _{2.1}	28.3 _{1.9}

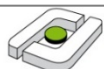
^{a,b} significant differences ($p \leq 0.05$)



LSQ-mean (SE as index) for behaviour of piglets

Trait	FTC	STC
Number of piglets (n)	95	116
Lying (%)	7.4 ^a _{1.0}	4.4 ^b _{1.0}
Sitting (%)	0.5 ^a _{0.0}	0.4 ^b _{0.0}
Standing (%)	9.6 ^a _{0.4}	8.4 ^b _{0.3}
Suckling (%)	26.6 _{1.5}	25.2 _{1.4}
Time in the nest (%)	55.9 ^a _{2.1}	61.6 ^b _{1.9}

^{a,b} significant differences ($p \leq 0.05$)



1. Losses of piglets due to crushing were not significantly higher in STC.
2. Daily gain of piglets was slightly higher in STC.
3. Sitting gilts occurred more often in FTC and no differences between FTC and STC were found in suckling frequency.
4. Higher moving activity of piglets in STC.

