

170. Rudd, A.R., Mendl, M.T., Simmins, P.H. and Broom, D.M. 1993. Importance of sow-litter bonding in loose-housed farrowing systems. In *Proc. Int. Cong. Appl. Ethol.*, ed. M. Nichelmann, H.K. Wierenga and S. Braun, 414-416. Darmstadt: K.T.B.L.

Importance of sow-litter bonding in loose-housed farrowing systems

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Introduction

The relationship between the sow and her offspring is likely to have a greater effect on piglet survival in loose-housed than in restrictive farrowing systems. Loose-housed systems allow the sow freedom to either neglect or care for her offspring. To ensure good survival and growth, piglets need a predictable, nutritious and easily-accessible milk supply. The sow in turn must balance investment in her offspring with investment in her own needs. The objective of this experiment was to examine sow behaviour in different farrowing systems and specifically to investigate the importance of sow-litter bonding for piglet welfare in loosehoused farrowing systems.

Methods

Three farrowing systems in neighbouring rooms were compared. In two systems the sows were loose-housed and could move freely: five strawed pens (2.5 m x 1.5 m) with farrowing rail (Pen), and five crates modified to allow the sows to walk through (Free Crate). Sows had access via a passageway to a transponder controlled feeder and a north facing outside area with two water drinkers. Piglets were contained in their home Pen or Free Crate area by a small barrier (30 cm high). The barriers were removed once 1 or 2 piglets could escape. The third system consisted of five conventional farrowing crates (Crate). In each system, two groups of five sows were observed regularly over at least 7 days between entry and weaning. Each observation day was made up of four periods from 9.00-10.00, 11.15-12.15, 13.45-14.45 and 16.00-17.00. Behaviour was recorded directly by instantaneous sampling. The categories of behaviour recorded are described as follows:

- Nursing:** *Sow offered her udder and issued low level grunts, piglets located the teats.*
- Milk letdown:** *Sow began grunting rapidly, piglets sucked on the teats.*

Time in farrowing area: The period that the sow occupied the pen or crate in which the litter was born.

Total inactivity: Sow was inactive, motionless or asleep.

Total interaction: Any form of aggressive or passive interaction between sows or sow and piglet.

Results and discussion

Tab. 1: Sow behaviour in the three farrowing systems

	Proportion of observation time			F-Test df 2,27	P-Value
	Crate	Free Crate	Pen		
Nursing	0.044	0.043	0.041	0.27	0.767
Milk letdown	0.004	0.002	0.003	1.99	0.144
Time in farrowing area	1.00 ^a	0.31 ^b	0.37 ^b	285.8	0.0001
Total inactivity	0.61	0.60	0.64	3.96	0.051
Total interaction	0.004 ^a	0.012 ^b	0.012 ^b	39.34	0.0001

Tab. 2: Piglet performance in the three farrowing systems

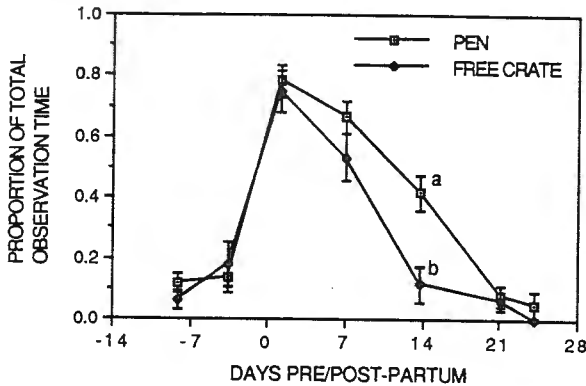
	Crate	Free Crate	Pen	F-test	P-value
Proportion of liveborn					
piglets weaned	0.87 ^a (.02)	0.65 ^b (.05)	0.75 ^c (.03)	10.75	0.0001
Mean (& s.e.) piglet					
growth rate (kg/day)	0.23 ^a (.01)	0.16 ^b (.01)	0.21 ^a (.01)	15.49	0.0001

n = 30 litters per treatment

a,b,c = Means on a row followed by different superscripts are significantly different (P < 0.05)

The proportion of observation time sows spent nursing was similar in the three systems. However, reduced piglet survival in loose-housed systems suggests that the quality of nursing may be sub-optimal. Loose-housed sows which had the freedom to do so, spent time away from the litter between nursing events. Occupation of the farrowing area greatly increased at parturition. However, in the period following farrowing, sows in the Free Crate system were quicker to leave the farrowing area than sows in the Pen system. As a sow began to vacate her farrowing area she would often attempt to nurse in the communal area in sight of the litter so encouraging her piglets to cross the barrier. Thus, in general, Free Crate piglets entered the communal area at an earlier age. It is interesting that piglets in this system had reduced growth rate and survival. For

both loose-housed systems, better piglet growth rate was related to greater sow occupation of the farrowing area ($r_s=0.6$, $P < 0.01$). Following barrier removal, piglets in both loose-housed systems were free to suckle from any available teat and, although cross-suckling was not frequent, it may have disadvantaged small piglets.



a, b = Different superscripts are significantly different ($P < 0.05$)

Fig.1: Sow occupation of farrowing area

Conclusions

There are two main factors influencing the success of loosehoused farrowing systems. Firstly, encouraging the sow to remain with the piglets immediately after birth appears to be important if she is to continue to invest sufficient resources over the postfarrowing period. Secondly the mixing of litters in loose-housed farrowing systems has to be carefully monitored to ensure that any mis-mothering does not disadvantage the weaker piglets. A better understanding of these and other factors influencing sow-litter bonding has the potential to improve piglet production and welfare of loose-housed farrowing systems.

Acknowledgement

This joint research project between Cambridge University and ADAS Terrington was funded by the Ministry of Agriculture, Fisheries and Food.