The effects of chain and feeder position on lying and dunging behaviour of finishing pigs in the presence and absence of straw

J.J. Zonderland and H.A.M. Spoolder
Research Institute for Animal Husbandry, PO Box 2176, 8203 AD, Lelystad, The Netherlands

Introduction The use of fully slatted flooring and absence of bedding for finishing pigs are being questioned for welfare reasons at Council of Europe level and have already been made illegal in some EU member states. Part slatted flooring offers an alternative, but their success depends to a large extend on the correct use of functional pen areas by the pigs: dunging should take place on the slats, lying on the solid floor. Pen lay-out has a large effect on the degree of pen fouling. The effects of straw provision on the solid floor area are less well documented. The present study tests the hypothesis that pen fouling in a converted standard Dutch pig pen is not affected by straw use, but by the position of the single space feeder as well as the position of a 40 cm chain (toy).

Materials and Methods A total of 384 finishing pigs (weight: 24.9kg, s.d.: 5.1) were allocated in 48 groups of 8 pigs to a 2x2x2 factorially designed experiment. The treatment factors were: feeder location (front or back of pen), chain location (front or back) and straw (either 35g pig^{-1} day^{-1} or no straw at all). Each combination of factors was repeated six times. The groups were split into two consecutive batches of 24 each, using four experimental rooms with similar ventilationsystems. The lay-out of the pens is shown in Figure 1. They were typical Dutch pens with an arched solid floor. The small slatted area nearest to the feeder passage was closed in all pens to allow the use of straw. Straw was kept out of the large slatted area by a 15 cm high wooden straw barrier. Pen fouling was scored twice weekly throughout the 16 week finishing period by estimating the percentage of soiled solid area. At the same time the number of pigs lying was scored. Lying behaviour was also scored indirectly around week seven of the finishing period by scan sampling 2x24 hour video taped recordings of each pen.

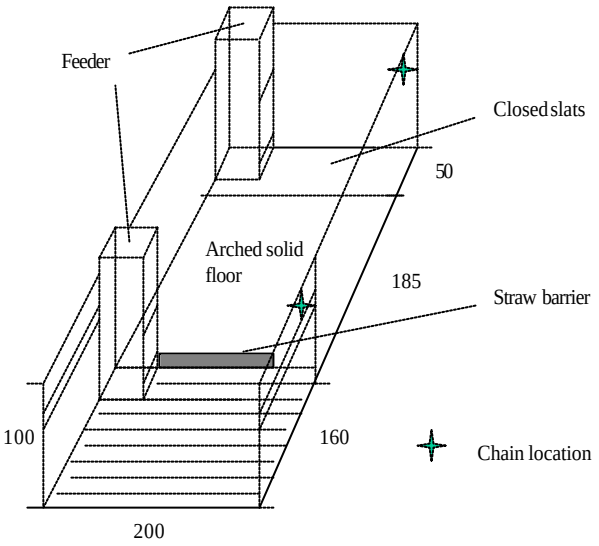

Figure 1 Pen lay-out. Feeders and chains were either placed at the front or at the back

Results
The results suggest straw use affects the number of pigs which lie during direct observation periods (with the observer walking through the feeder passage) but not during video recorded observations (Table 1). Pen fouling appears to be affected by feeder position and straw use, but not by the position of the chain (Table 1). The best results in terms of pen cleanliness were obtained by positioning the feeder at the front of the pen and not using straw .

Table 1 Average percentage of lying animals per pen per treatment (S = straw; F = feeder; C = chain) with direct observations and indirect (videotaped) observations, and average percentage of pen soiling.

S	Yes				No					P-Values [1]						
F	Front		Back		Front		Back									
C	Front	Back	Front	Back	Front	Back	Front	Back	IQR[2]	S	F	C	S*F	S*C	F*C	S*F*C
Lying (direct) [3]	68.8	69.1	69.1	69.4	59.7	58.2	56.7	60.2	48.8-77.2	*	n.s.	n.s.	-	-	-	-
Lying (indirect) [3]	88.5	85.2	86.4	89.4	88.3	86.8	85.9	87.0	84.9-90.1	n.s.	n.s.	n.s.	-	-	-	-
Pen soiling [4]	1.5	3.2	5.7	3.7	1.1	0.6	1.6	1.7	0.9-4.4	***	*	n.s.	n.s.	n.s.	n.s.	n.s.

[1] Significance: n.s = not significant; * = p< 0.05; ** = p< 0.01; *** = p < 0.001
[2] Inter Quartile Range.
[3] Data could not be normalised. The statistical test used was Wilcoxon/Kruskal-Wallis.
[4] Data had to be transformed prior to analysis. Means are back-transformed values. IQR was based on original data.

Conclusions The observations on lying behaviour may suggest that straw helps to reduce 'nervousness' or 'alertness' in pigs. However, using straw in the present simple conversion of a typical Dutch finishing pen will result in increased pen fouling, even though a feeder at the front of the pen may to a degree mitigate this effect.