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CONSEQUENCES OF TETHERING SOWS

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by G. van Putten*
Research Institute for Animal Production, P.O. Box 501, 3700 AM Zeist, The Netherlands

1. Introduction

After the second world war one of the largest improvements in pig breeding was the installation of protective bars in farrowing pens. Thus an escape was provided for piglets being in danger being crushed between the sow and the wall. The next improvement was the local heating of a small area of the pen, only accessible for piglets. This measure was expected to keep away the piglets from the vicinity of the sow. Nevertheless a too large percentage of the piglets was found dead, presumably crushed.

The high mortality in piglets was one of the reasons for confining sows in the farrowing pen. This confinement was either realized by putting the sow in a crate or by tethering. Thus the "clumsy" sow would be unable to crush the poor helpless piglets. Nevertheless the average mortality in piglets still is between 14 % and 17 %, depending on the type of farrowing pen (KLAVER, 1981). However the use of straw decreases this mortality rate considerably (VELLENGA c.s., 1983), although straw is supposed to be hindrance for piglets trying to escape from the sow.

2. Remaining problems

Fixation of the sows during the whole reproductive cycle, combined with the absence of straw and the use of slatted floors instead, resulted in a high culling rate. In The Netherlands every year 45 % of the sows has to be culled (TUINTE, 1979). This is partly due to fertility problems (about 50 %) and partly to locomotion disturbances. Obviously individual housing is detrimental to the health and well-being of the sows. On the other hand notwithstanding all our efforts far too many piglets are crushed.

The present situation made us formulate the following statement of objectives for an orientative observation:
"Does fixation (tethering) itself increase the possibility of crushing piglets?"
In other words we planned to analyze in detail:
- how are sows lying down before farrowing, if tethered or free in pen?

- how are sows lying down after farrowing, if tethered or free in pen?
- does tethering make any difference in the procedure of lying down compared with sows free in a pen?

3. Experiment

Two sows, tethered by a neck harness, and two sows free in a Danish pen were observed before and after farrowing. The sows were crossbred (GY x DL) and were farrowing for the second time. There lying down was recorded by video (24 pictures per second). Afterwards these video tapes were analyzed for which the speed was slowed down 12 or even 24 times. Thus the durations of the stages of lying down could be timed exactly. These stages were chosen in such a way, that the begin and end of each stage could easily be recognized. They are:

- lifting a front leg — stage 1
- bending knee(s) — stage 2
- being on both knees — stage 3
- shoving forward — stage 4
- letting down hindquarters and lying on the breast.

4. Results

The duration of every stage was expressed in minutes and centi-minutes, in order to make calculations easier. Because a member of lying-down procedures in every animal was recorded, also standard deviations are given. The increase in time of the lying down procedure has been calculated as a percentage of the duration of lying down before farrowing (Table).

In figure 1 and figure 2 sketches are drawn for illustrating the procedure of lying down of a sow free in a Danish pen and of a tethered sow, both before and after farrowing.

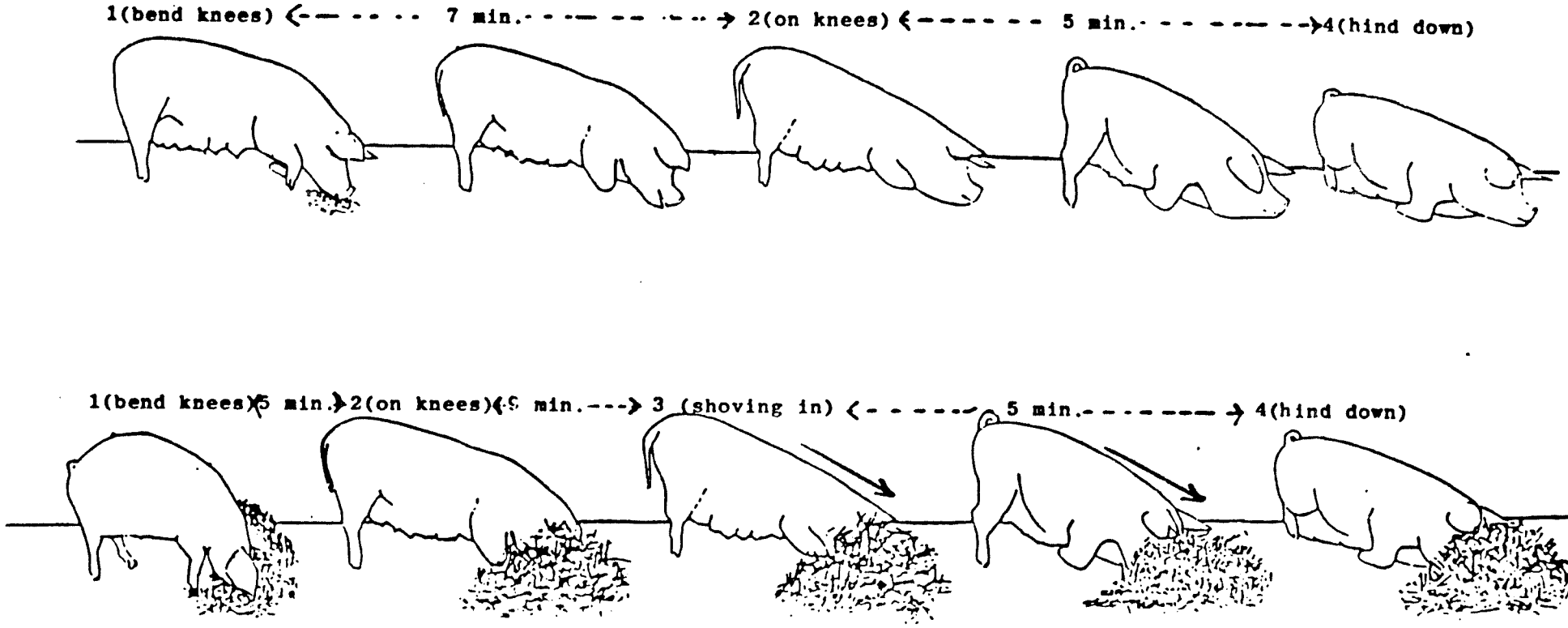

Fig. 1: Lying down procedure of a sow, free in a Danish pen. The upper line shows its behaviour before farrowing. The lower line shows the lying down behaviour after farrowing. After KARG & JANSEN (1986).

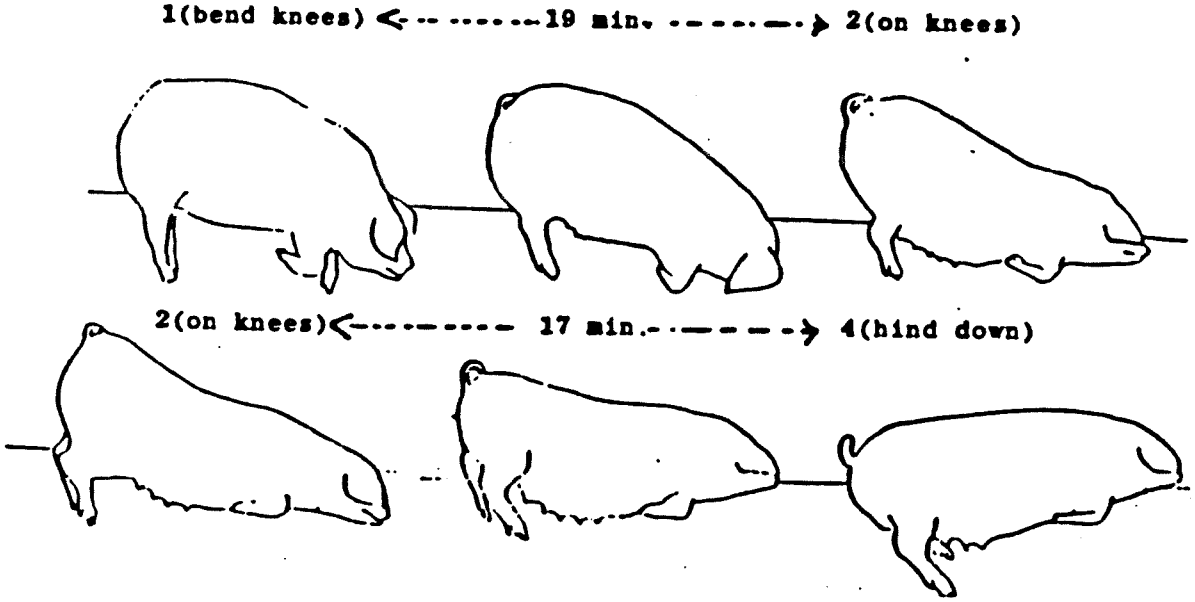

Fig. 2: Lying down procedure of a tethered sow, before and after farrowing. This particular sow was tethered by means of a harness around the neck. In order to make the behaviour more clearly visible, the tethering system itself is not indicated. (After KARG & JANSEN, 1986).

			stages of lying down					
			1	2	3	4		
system	nr.sow	farrowing	bend knee(s)	on knees	shoving in	hind down	total proc.	%
Danish	1	before	2,5±0,6	3,8±0,9		4,8±1,8	11,1±1,4	55
	1	after	3,4±1,1	2,4±1,4	5,9±0,4	5,5±2,4	17,2±2,1	
Danish	2	before	3,8±1,2	7,2±1,5		5,0±1,9	16,0±1,1	9
	2	after	3,3±0,1	5,0±3,2	9,3±1,2	4,8±5,1	17,4±2,4	
tethered	3	before	13,3±16,2	41,5±20,2		26,9±6,9	81,6±30,9	3
	3	after	3,9±1,3	46,3±18,3		34,0±13,6	84,2±25,3	
tethered	4	before	4,3±3,8	19,4±11,8		11,3±13,6	34,9±13,2	2
	4	after	4,2±3,6	19,3±8,0		17,1±7,0	4,06±16,0	

Table. The period of time used for lying down by sows before and after parturition. The whole lying down procedure has been divided in stages. The period of time every stage takes has been expressed in minutes and centi-minutes (standard deviations are added). Two housing systems are compared: a Danish farrowing pen and a farrowing pen with the sow tethered.

5. Discussion and conclusions

The small number of animals stresses the point, that the experiment can only serve as an orientation towards the question whether further observations would be worthwhile.

Nevertheless the limited data show, that in tethered sows the procedure of lying down before and after farrowing is very much unchanged. However sows being free in a Danish pen showed a considerable increase in the duration of lying down. The difference between the situation before and after farrowing is partly due to the "shoving in" behaviour these sows develop. This shoving into the nest with the snout making sweeping movements in the straw serves to remove piglets from the place where the sow intends to ly down. Thus we can only conclude so far, that tethering the sow on one hand may offer the piglets a better change to survive, but on the other hand makes it impossible for the sow to shove into the nest carefully and thereby preventing the piglets from being crushed. Which factor has a higher importance for piglets' survival we don't know. Obviously more research is needed to find out.

6. References

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