



Effects of the body size of sows on maternal behaviour in farrowing pens, animal welfare, and crushing of piglets

Cornelia Vontobel¹, Roland Weber², Beat Wechsler¹, Joan-Bryce Burla²

¹ Centre for Proper Housing of Ruminants and Pigs, Federal Food Safety and Veterinary Office FSVO, CH-8356, Ettenhausen. ² Centre for Proper Housing of Ruminants and Pigs, Agroscope, CH-8356, Ettenhausen

Key words

Sow, body size, normal behaviour, free farrowing pen, space allowance, animal welfare, crushing of piglets

Aim of the study

This study was performed to:

- evaluate how sows perform nest-building and pre-lying behaviour under non-restricted spatial conditions (base for comparison with part 2) and how much space they occupy during these behaviour in dependence of their body size (part 1);
- experimentally assess how different space allowances of the farrowing pens' nest/lying area affects the sows' ability to perform nest-building and pre-lying behaviour in dependence of their body size and how this affects the grouping behaviour of piglets and piglet losses in the first days after farrowing (part 2);
- collect data on Swiss commercial farms regarding current body size distribution of sows, space allowance of farrowing pens, and piglet losses due to crushing (part 3).

Material and methods

Part 1: A sample size of free-moving sows were observed in enlarged, structured farrowing pens with a total area of 13.1 m² from one day before until four days after farrowing by video recordings. Nest-building activity of 18 sows during the last 8 hours before farrowing was analysed continuously. Further, the pre-lying behaviour of 16 sows as well as the grouping behaviour (cluster building) of their piglets were observed during 190 lying down events on day 1, 3 and 4 after farrowing.

Part 2: Behavioural observations were conducted identically as in part 1. Nest-building activity of 27 sows and pre-lying behaviour of 24 sows as well as the grouping behaviour (cluster building) of their piglets were analysed. In contrast to part 1, farrowing pen size was adapted to sow body length by using different factors (from 0.6x to 1.15x sow body length), causing different extents of spatial restriction.

Part 3: Data was obtained from 12 Swiss farms including a total of 879 litters with 11'339 live-born piglets. The farmers were instructed to take detailed records of all piglet losses occurring in the first week after birth. They specified the cause of death of each live-born piglet (crushed versus not crushed). In addition, the piglets' age, sex, and weight were recorded.

Results and significance

Part 1 and 2: Sows performed a large number of nest-building elements when being provided with sufficient space. Even behavioural patterns often associated with restricted space allowance were observed in sows in enlarged pens. The results of the pre-lying behaviour of part 1 show the importance of the sow's choice of the lying place based on the whereabouts of the majority of her piglets, expressed with the so-called Care-Score (CS). With a higher CS the ratio of lying down events with piglets „in high danger” of being crushed decreased strongly. Cluster building also tendentially increased with an increasing CS.

Part 3: In total, farmers' records of 1214 live-born losses were analysed, whereof 64% were classified as crushed. Of the crushed piglets, 28.1% had no external signs of trauma, 49.2% were underweight, and 3.2% showed signs of weakness, which strongly indicates an overestimation of primary crushing losses on farm.

Publications, posters, and presentations

Vontobel, C.; Wechsler, B.; Burla, J.-B. (in preparation). Influence of farrowing pen size on pre-lying behaviour of sows and grouping behaviour of piglets in the first days after farrowing, Applied Animal Behaviour Science.

Vontobel, C.; Scriba-Janulis, M.; Wechsler, B.; Burla, J.-B. (in preparation). Influence of farrowing pen size on nest-building behaviour in the last 8 hours before parturition, Applied Animal Behaviour Science.

Vontobel, C.; Simmler, M.; Wechsler, B.; Burla, J.-B. (in preparation). Risk factors for piglet mortality in free farrowing systems in Switzerland based on farmer's records, Journal of Porcine Health Management.

Vontobel, C.; Grahofer, A.; Wechsler, B.; Burla, J.-B. 2020. Detailed analysis of farmer's records of piglet mortality in free farrowing systems in Switzerland, Oral presentation, 12th European Symposium of Porcine Health Management, April 27th- May 1st 2020 (postponed to April 14th- April 16th 2021), Bern, Switzerland.

Vontobel, C.; Wechsler, B.; Weber, R.; Burla, J.-B. 2019. Verhalten freibeweglicher Muttersauen und ihrer Ferkel zum Zeitpunkt des Abliegens – Behaviour of free-moving sows and their piglets before lying down, KTBL-Schrift: Aktuelle Arbeiten zur artgemäßen Tierhaltung 518, 246-257.

Vontobel, C.; Wechsler, B.; Weber, R.; Burla, J.-B. 2019. Verhalten freibeweglicher Muttersauen und ihrer Ferkel zum Zeitpunkt des Abliegens, Oral presentation, 51. Internationale Tagung für angewandte Ethologie, 28.-30. Nov. 2019, Freiburg i. Br., Germany.

Vontobel, C.; Wechsler, B.; Weber, R.; Burla, J.-B. 2018. Variation des Nestbauverhaltens vor dem Abferkeln bei freibeweglichen Muttersauen - Variation in nest-building behaviour before farrowing of free-moving sows, KTBL-Schrift: Aktuelle Arbeiten zur artgemäßen Tierhaltung 514, 176-187.

Vontobel, C.; Wechsler, B.; Weber, R.; Burla, J.-B. 2018. Variation des Nestbauverhaltens vor dem Abferkeln bei freibeweglichen Muttersauen, Oral presentation, 50. Internationale Tagung für angewandte Ethologie, 22.-24. Nov. 2018, Freiburg i. Br., Germany.

Project 2.17.04

Project duration 01.04.2017 – 31.10.2020