INFLUENCE OF DIFFERENT SURFACE OF FLOOR OF FARROWING PENS ON LIMBS INJURY

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Abstract

Mass occurrence of skin abrasion with following infection of wounds and joints was documented in suckling piglets in farrowing pens in commercial pig farm. Skin trauma was evoked due to employment of disinfectant with glycerin content that created oil film on the flat and smooth surface of plastic grates where piglets slide back. This induced wound infection and following arthritis rise produced by Streptococcus suis serovar 1. Deletion of disinfections was demonstrated by reduction injury of thoracic limb from 70 to 50 % of piglets (P>0,01). Covering of slippery grates by plastic matting was demonstrated by significant (P>0,01) reduction injury of thoracic (from 50 on old grates resp. 36 on new grates to 7%) and pelvic (from 86 resp. 95 to 44 % of piglets) limbs to.

Keywords: Limbs injury, farrowing pen, piglet

Skin damage often causes worsened movement of piglets and at the same time it is an entrance gate for infection that may be manifested by laminitis, arthritis or sepsis. Especially in newborn piglets the skin is soft and wet and therefore sensitive to injuries and a suitable medium for bacterial colonization. Skin lesions on extremities developing soon after birth are very often the result of a contact with the surface of the floor of the delivery room. According to some findings the occurrence of skin abrasions in piglets of the age below one week depends on the total time spent by suckling and lying and the sow's nipples (e.g. MOUTTOTOU and GREEN, 1999). Abrasions, wounds, later skin necrosis are the most common feet injuries (MOUTTOTOU et all., 1999). Abrasions of carpal joints, sores on elbows, the coronet, or blotches are the most common cases. Most lesions cause only slight problems connected with movement restrictions for piglets. However, these lesions may be an entrance gate for bacteria from the outside environment into the body causing subsequent infection.

Pathogenic streptococcus species may penetrate through the wounds in the skin into blood and if they are carried into the tissue of target organs, arthritis, endocarditis or meningitis may develop. Their own mothers may be the source of infection for piglets when they have the tissue of tonsils in the respiratory, genital and digestive system colonized by pathogenic streptococcus (WINDSOR 1978).

Skin affects start by erosions or rhagades, bilaterally on pelvic and thoracic extremities. Changes can be detected soon after birth. According to some studies skin erosions were found in up to 98 % of three-day- piglets; most lesions were successfully healed within three weeks (SVENDSEN et all., 1976, FURNISS et all., 1986).

After pathogenic streptococci penetrate the blood stream, bacteraemia develops and it results in arthritis. Arthritides hinder the movement ability of piglets, they are the cause of permanent aftereffects having a significant impact on reduced exploitation of growth abilities (ZORIC et all., 2003).

An early therapeutic intervention reduces the length of disease, reduces mortality, it does not however solve the risk factors connected with lacks in technology and technological practice (ZORIC et all., 2004).

From the data in the quotation it is evident that the existence, cause and possibility to get rid of the problem have been known for several years. Unfortunately, we meet this problem in current conditions for the pig breeding; therefore we concentrate on it in our experiment.

Material and methods

Experiment was made in operating conditions of commercial pig breeding with well kept tour system. The sows were kept in renewed spaces; delivery rooms were equipped by full-grating-plastic floor. This mass occurrence of feet injuries with arthritis, laminitis and the death of piglets on sepsis resulting from was noted for the first time in this reconstructed breeding. Possible technological impacts giving rise to this disease were evaluated. Piglets from the birth to the age of eleven days were examined for the occurrence of traumatic injuries, bruises and not affected piglets were counted. To identify the causative agent, samples from skin changes, synovial fluid from affected joints and smear from the grating surface were taken. The causative agent, the dynamic of the course of the disease were determined and preventive measures were suggested(BEDNÁŘ et all., 2006).

The following conclusion was made by an analysis of technological practice and technologies used: immediately after delivery a disinfection of delivery room is being made by the disinfection means containing glycerin– with respect to the fact that glycerin is an oil substance

increasing slipperiness of the floor- the first prevention step was stopping to use it. In grating in delivery rooms a changed surface was determined in comparison to the new grating – the new grating was slightly wrinkled, not smooth and glossy, like the grating used for a long time. By a closer examination small sharp edged cracks were found on the grating used. That is why we recommended a change of the old ones for the new ones in some stalls and think of a possibility of removing the grating in the space where piglets move while suckling and replace them by a solid groundsheet. To verify a possible effect of a part of non-grating floor the space around the sow's nipples was covered by a plastic mat.

The impact of particular floor adaptations of delivery rooms on the rise of traumatic injuries, bruises and the occurrence of not affected piglets was compared by means of the statistical program TriloByte QC.Expert 2.7.

Results and discussion

Elimination of the disinfection of delivery rooms after delivery was the first intervention into technological practice (Table 1). This intervention showed up in a positive way in almost all the monitored markers.

Reducing the percentage of piglets in a litter with a traumatic injury of forelimbs was statistically significant. Also a tendency of a reduced occurrence of bruises to the half and a doubling the percentage of piglets without finding may be considered to be a positive achievement. The percentage of piglets with traumatic damage on rear extremities did hardly change.

Based on the results achieved it can be concluded that a non-application of the oil substance immediately after the birth reduces the slippery character of the floor, piglets move more safely, the injuries are however caused by the edges of the grating, the piglets lean towards them while suckling.

The comparison of not disinfected (more accurately not oiled) old and new, particularly covered grating (Table 2) shows up a statistically significant reducing of the occurrence of piglets with traumatic damage on front and rear extremities. A statistically significant increase of piglets with bruises is because of the fact that for the purposes of the experiment not an appropriate plastic module was used to create a non-grated floor but the current grating was covered by plastic mats that were slippery because of water, urine or feces. Better results could have been reached by using a full floor piece with anti slippery surface.

Table 1. Influence of the oil disinfection solution on the % of piglets with a damage on extremities

	Oil disinfection means used	Oil disinfection means excluded	Index
Litters monitored	53	36	
Traumatic injuries of forelimbs	69.51^{A}	49.81^{B}	71.66
Traumatic injuries on rear limbs	87.13	85.89	98.58
Bruises on limbs	27.77	13.71	49.37
% of piglets without changes	7.28	13.74	188.74

Values marked by different capital letters are statistically highly demonstratively different (P>0.01)

Table 2. Comparison of the influence of long time used grating (A), new grating (B) and covering of a part of grating around the sow's nipples with a plastic mat (C) on the % of piglets with damaged limbs

	A	B	C
Litters monitored	18	16	8
Traumatic injuries of forelimbs	49.81^{A}	36.20^{A}	6.63^{B}
Traumatic injuries on rear limbs	85.89^{A}	94.47^{A}	43.94^{B}
Bruises on limbs	13.71^{A}	25.16^{a}	74.34^{Bb}
% of piglets without changes	13.74	4.49^{A}	17.52^{B}

Values marked by different capital letters are statistically highly demonstratively different (P>0.01), values marked by different small letters are statistically significantly different (P>0.05)

Conclusion

The results obtained prove that the disinfection means used to perform a disinfection of the delivery room immediately after delivery must be chosen not only with respect to its efficiency spectrum but also according to its physical properties – in this particular case the oil substance increased the slipperiness of the floor resulting in bruises and injuries on front extremities.

In this breeding covering of a part of grating where piglets move around while suckling proved to be the best prevention measure.

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