INFLUENCE OF FLOOR TYPE ON THE INCIDENCE AND SEVERITY OF LEG WEAKNESS SYNDROME (LWS) AND OF ARTICULAR OSTEOCHONDROSIS (OC) IN ITALIAN HEAVY PIG.

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Introduction

The condition known as "Leg Weakness Syndrome" (LWS) is one of the most important cause of culling in growing and fattening pigs, causing severe productive and economic loss. This syndrome, characterized by limb deformities and locomotor dysfunction, is a multi-factorial disease with a polymorphous symptomatology and is widespread in all types of genetic and pig husbandry. Osteochondrosis (OC), osteocondritis dissecans (OCD) and degenerative joint disease (DJD) are the most frequent articular lesions associated with leg weakness (Reiland, 1978). The floor type, i.e. too firm or too slippery or with reduced support, can add further mechanical stress and may be a predisposing condition for increased foot and leg problems.

The aim of this study was to examine the influence of floor type on the incidence of LWS and on the frequency and severity of articular osteochondrotic lesions in fattening pigs.

Material and Methods

The study was carried out in an experimental facility in Northern Italy. The experiment took place over two successive trials in 2002. In both trials, 264 commercial hybrid pigs 170-180 days old and with an average live weight of 90 kg were used. Only animals with normal limb conformation were selected. Both trials lasted from the day of selection (T0) to the day the animals were slaughtered at approximately 270 days of age. The experimental building was divided into 3 different rooms with different floor types for a total of 22 pens: room 1 (a concrete solid floor with a slatted area for dunging 1m wide under the windows); room 2 (a concrete fully slatted floor); room 3 (a concrete solid floor with an outdoor dunging slatted area 140 cm wide and as long as the pen). Where present, the gaps consisted of 2 centimetre spaces between 8 cm wide cement slates. The population density of the pig was at least $1m^2$/pig. In both trials, the animals were randomly distributed in the three rooms as follows: room 1: 72 animals; room 2: 96 animals; room 3: 96 animals. Two days before slaughter a clinical study was carried out to find any signs of lameness and gait changes for all animals. The clinical signs were classified according to an arbitrary scheme based on a severity score of lameness (from 1 to 4). A macroscopical study of the front leg joints of 120 animals in the first trial and 118 in the second one was carried out. The scapulo-humeral and radio-humeral joints of all animals were analysed considering the following articulation areas: the glenoid cavity of the scapula; the central area of the humeral head; the medial humeral condyle. The severity of lesions in fore legs was measured according to Borghetti et al., 1991. In order to study the association between symptomatology and joint lesions, the animals were divided into two distinct categories: animals without lesions or with grade 1 and 2 lesions (sub-clinical OC); animals with grade 3 and 4 lesions (clinical OC). This choice was made for physiopathological reasons given that 3 and especially 4 grade lesions showed damage [raising and loss of cartilage (OCD), osteoarthritis (OA) and bone exposure, acute synovitis] able to induce pain and so to be clinically evident.

Results

The results of the clinical examination are reported in table 1 and of the anatomopathological examination of the front limb joints in table 2.

Table 1. Clinical examination (trial 1 plus trial 2)

	Healthy	Healthy (%)	With Clinical Symptoms	With Clinical Symptoms (%)
Room 1	121	85	21^{a}*	15
Room 2	136	71	56^{b}*	29
Room 3	181	96	7^{c}*	4

*With different letters $p < 0{\cdot}02$ (statistically significant difference)

Table 2. Results of the anatomopathological examination of the front leg joints

	Trial 1		*Trial 2*	
	Animals with OC lesion			
	Clinical	Subclinical	Clinical	Subclinical
Room 1	6	18	3	21
Room 2	5	42	14	34
Room 3	15	33	11	37

No significant statistical differences in the anatomopathological examination of the fore limb joints were found.

Discussion and Conclusion

The significant clinical difference which was found in both trials, indicated that the slatted floor (room 2) is more critical than the other two examined for LWS incidence and severity. Unlike the clinical results, the anatomopathological exams, that evaluated their potential ability to cause symptoms, did not show any significant difference between the different floor types. Our results can be explained considering that the appearance of clinical signs can be influenced by very different situations not only related to the severity of articular cartilage damage. We think that the fully slatted floor by increasing the static overload, muscle development and reducing the locomotory ability, could influence more drastically the incidence of abnormal leg conformations. Furthermore, it could induce a structural muscular weakness not directly related to a greater occurrence of severe OC lesions.

References

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