SOW HOUSING: RISK FACTORS AND ASSESSMENT TECHNIQUES FOR LAMENESS, PRODUCTIVITY AND LONGEVITY IN GROUP AND INDIVIDUALLY HOUSED GESTATING SOWS

PROJECT LEADERS

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PROJECT OBJECTIVE

The assessment of risk factors affecting the productivity and longevity in gestating group housed sows, and over a variety of management systems, with a special focus on lameness.

> *A model to determine the optimal time for culling a sow from an economic standpoint was validated.*

FINAL RESULTS

LAMENESS ASSESSMENT USING A FORCE PLATE SCALE

A force plate scale, specially designed to measure weight distribution and weight shifting of gestating sows, was successfully developed. Results indicate that the force plate scale could become an effective tool for early detection and measurement of lameness. Also, the multi-technic and multivariate approach studied (force plate scale, kinematics and accelerometers) enabled the definition of two types of lameness expression characterised by stiff gait and high weight shifting, respectively.

LAMENESS ASSESSMENT USING INFRARED THERMOGRAPHY (IRT)

Results showed that limb conformation, weight and parity affected the IRT temperatures. However, IRT was effective when compared to visual scores and may be a useful method of detecting

> *Force plate scale, a promising technique developed to identify early lameness.*

early signs of inflammation and injury in the lower limbs and hooves of sows in the future. Currently the cost is prohibitive for routine on-farm diagnostics.

FACTORS CONTRIBUTING TO SOW LAMENESS, PRODUCTIVITY AND LONGEVITY

Temperament traits

Sow temperament traits associated with active-passive and confident-fearful dimensions showed significant differences between breeds and between housing systems. In free-access housing, sow breed line and age affected temperament measures but not floor type or pen configuration. In the electronic sow feeding (ESF) systems, flooring type and age (parity) influenced sow behaviour responses in temperament tests. However, within the management and group housing systems investigated, there were only minor effects of temperament on production variables. Body injury score was related to temperament which differed between the two ESF systems. Flooring in the ESF systems was associated with the incidence of lameness; lameness was significantly higher on the partial-slatted flooring system and in that system only, there was a relationship between injury score and lameness.

Simulation model predictor of sow longevity and profitability

A sow longevity simulation model was validated and refined using data sets from two group housing systems. It demonstrated that, as expected, the model can determine the optimal time for culling a sow from an economic standpoint.

Calcium-phosphorus balance and bone density

Group housed sows fed a low calcium diet had reduced serum calcium and serum phosphorus. However, bone biomarkers (resorption or formation) were similar; litter sizes and growth rate were unaffected by diet and were improved with group housing. The requirement for dietary calcium as prescribed by the 1998 NRC, and thus for NRC 2012 is adequate for high producing sows of modern genetics, whether housed in groups or stalls.

Methods of synchronizing gilt breeding and impact on sow longevity

Early induction of puberty with hormone treatment decreased the age of first farrowing in gilts and resulted in larger first litters. Culling before first breeding was higher in hormonally-induced gilts, however, culling rate and reasons for culling subsequently were not different between treated and control sows. The culling rate for lameness and downers was about 15.6% overall. Longevity of gilts in the breeding herd was not affected by hormone treatment for puberty induction.