RESEARCH ABSTRACT

ANIMAL WELFARE

Title: **"An Industry Education Program for Understanding the Basics of the Space Allocation Debate in Pig Production" - NPB #05-211**

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Scientific Abstract:

The efficient use of facility space for swine production has been a key economic and production issue since the introduction of confinement production facilities. Stocking density decisions have traditionally focused on economically efficient stocking levels accounting for pig performance and facility utilization. A return on equity (ROE) financial simulation model is developed that overlays three stages of production (farrowing, nursery and finishing), a model of system pig flows is supported by a lean growth model, and a hog pricing model that includes pig weights and carcass composition for packer grid assessment. The model is created using Microsoft Excel version 2003.

Evaluating economic and production consequences of space allocation restrictions is the purpose of this model, so we need to define space allocation in this context. A National Pork Board (NPB) working group examined the issue of space allocation in grow-finish facilities (Gonyou et al., 2004). The definition of space used in PSAM is based upon the work of this group and an examination of published literature on the effect of floor space allocation on performance from initiation of an experiment until final weight (235 lb BW or greater). Floor space was expressed by the following equation: $A=k*BW^{.667}$
Where A is the area of space allocation in square meters and BW is the *final* body weight in kilograms (Petherick, 1983).

To determine the system impacts of space allocation, the *rate* of pig flow through the facility was projected so this required the incorporation of a growth model for pigs during the finishing phase of production. The growth model was selected to characterize not only the final weights of pigs when marketing with different ending space allocations, but also to model the variation among pigs at the finishing end point. This allows for a more realistic simulation of barn closeouts. The model adapted to accomplish this was originally reported by Schinckel et al. (2002) and (2003).