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## IMPACT OF FEED RESTRICTION ON HEALTH, DIGESTION AND PERFORMANCE OF GROWING PIGS HOUSED IN POOR HYGIENE CONDITIONS

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### Abstract

Health deterioration in pigs results in significant economic losses caused by growth check and morbidity. Feed restriction is commonly applied to preserve gut health and to limit antibiotic use. This study assessed the effect of a feed restriction on growing pigs submitted to a low grade inflammation induced by the degradation of the environmental hygiene.

The experiment was run in two replicates of 40 pigs each. Twenty blocks of 4 pigs, half castrated males and half females, were selected, 3 weeks after weaning, at 7 weeks of age. Within a block, the 4 littermates had a similar body weight and each pig was affected to an experimental group according to a 2 x 2 factorial design: 2 feeding levels, *ad libitum* (AL) and restricted (R) at 60% of AL, and 2 levels of environmental hygiene. Pigs were housed individually throughout the experiment. Feed restriction was applied from 61 to 89 d of age. From 61 to 68 d of age, piglets were housed in a post weaning unit. At 68 d of age, pigs were transferred in a growing unit where 2 pigs per block were housed in an unclean environment (no cleaning and disinfection of the rooms after a previous occupation by non-experimental pigs) and the others in a clean environment for 5 weeks (102 d of age). Pigs were fed a standard growing diet containing 0.4% of TiO<sub>2</sub> as an indigestible marker of digestibility. Growth performance was weekly recorded and blood (at 61, 75 and 89 d of age) and fecal (at 88 and 98 d of age) samples were collected to measure indicators of inflammation (plasma haptoglobin, blood total leucocytes, granulocytes and lymphocytes) and nutrient digestibility. Feces consistency was monitored daily to detect diarrheas.

R pigs were lighter than AL pigs at 68 d of age (24.1 kg vs 26.4 kg). Feed restriction decreased daily weight gain, increased the feed conversion ratio and improved crude protein digestibility. Poor hygiene conditions decreased growth performance and fecal digestibility of all nutrients. Haptoglobin concentrations and leucocyte and granulocyte numbers were higher in poor hygiene conditions, confirming that the model was effective to induce an inflammatory response. Nevertheless, feed restriction did not modify the inflammatory response but reduced the occurrence of diarrhea in poor hygiene conditions. Apart from digestive disorders, this study showed no beneficial effect of feed restriction on the inflammatory response caused by poor hygiene conditions.