

# Variability of the lysine requirement of growing pigs

Soenke Moehn<sup>1</sup>, Robert F. Bertolo<sup>1</sup>, Paul B. Pencharz<sup>2</sup> and Ronald O. Ball<sup>1</sup>

<sup>1</sup>Swine Research & Technology Centre, 4-10 Agriculture/Forestry Centre, University of Alberta, Edmonton, AB T6G 2P5; Research Institute, Hospital for Sick Children, Toronto, ON.  
*Email:* ron.ball@ualberta.ca

Lysine (LYS) requirements for the mean in a population of growing pigs are well established, but there are no estimates of its variability. The indicator amino acid oxidation method (IAAO) allows repeated measurements in rapid succession so that the amino acid requirement can be determined for individual pigs. The objective was to determine the (LYS) requirement in individual pigs to derive a first estimate of the population mean requirement and its variability.

Nine individually housed barrows (20 to 27 kg body weight) were surgically implanted with venous catheters for isotope infusion. Pigs were offered, in random order, isonitrogenous and isoenergetic diets with one of seven LYS concentrations (4.8 to 15.5 g/kg diet). The pigs were fed twice daily, except for study days when they received half the daily allowance in eight equal hourly meals. After a validated minimum adaptation period, indicator (phenylalanine, PHE) oxidation was determined for each dietary lysine level during a 4-h primed, constant infusion of L-[1-<sup>14</sup>C]PHE. The LYS requirement was calculated using a two-phase linear regression crossover analysis within individual pigs. For each pig, PHE oxidation decreased linearly ( $P < 0.02$ ) as the dietary LYS concentration increased until the requirement was reached; thereafter, PHE oxidation was not different. The true ileal digestible LYS requirement ranged between 7.5 and 10.6 g/kg diet for the nine individual animals. The mean requirement for all pigs was 9.1 g/d (CV, 11.6%) or 93.9% (CV 9.8%) of the predicted requirement (NRC 1998) based on each pig's mean body weight and energy intake. IAAO gave values for LYS requirement similar to conventional methods.

**Implications:** The short (<3 weeks) experimental period allowed, for the first time, the calculation of population variability in LYS requirement, which varied between 7.5 and 10.6 g/kg for pigs between 20 and 27 kg. This allows for more accurate calculation of the effect of altering LYS intake on herd performance and production economics.

Supported by Alberta Pork, Alberta Agricultural Research Institute and Degussa