Introduction and objective

- Recent experimental evidence suggests that Val is the next-limiting amino acid for pigs in cereal-soybean meal based diets (after Lys, Met, Thr, and Trp, but before Ile).
- Information on the Val requirement for growing pigs is scarce.
- L-Val is now available as a free amino acid, allowing the formulation of diets with a very low protein content.
- Objective: perform a meta-analysis of available data on the response of growing pigs to the Val supply.

Data and statistical analysis

- 28 dose-response studies with at least 4 levels of Val were obtained from 20 publications (9 of which were peer-reviewed).
- The composition of feed ingredients (Sauvant et al., 2004) was used to calculate the standardized ileal digestibility (SID) and nutrient composition.
- Data were standardized (Figures 1 and 2):
  - relative to the NRC (1998) requirement estimate (as a % in the diet or relative to Lys, depending on the design of the study)
  - relative to the response at the highest level of Val supplementation

Results

- The responses of feed intake and daily gain to the Val supply were very similar (Figure 2).
- Val requirement estimates ranged from 87-117% of the NRC (1998) value for feed intake, and from 84-114% for daily gain (94% on average, which corresponds to 64% SID Val:Lys).
- Increasing the SID Val:Lys supply from 64% to 69% resulted in a 5% performance increase.
- A 10% reduction in Val supply below the requirement reduced feed intake and growth by respectively 23% and 27%.
- The Val requirement may increase with increasing amino acid or protein level (Figure 4 and Table 1):

Conclusions

- Most of the studies on Val requirements have been carried out in pigs weighing <35 kg.
- Most of the response to a Val deficiency occurs through a reduction in feed intake.
- To maximize growth, 69% SID Val:Lys is required.
- A Val deficiency results in a strong reduction in performance.
- The amino acid or protein content of the diet may have an impact of the Val requirement.