Effect of genotype and Leucine level on the amino acids concentration in tissues of weaned pigs

Leucine (Leu) is a branched chain amino acid (BCAA) whose requirement is ongoing object of study. It regulates the catabolism of the 3 BCAA (i.e. Leu, Val and Ile) and its excess leads to an increase in their catabolism. Leu can influence lysine (Lys) absorption too, with possible interaction with Lys requirement too. Moreover, Lys inefficiency in protein deposition can be due to its degradation by the bifunctional protein aminoadipate-semialdehyde synthase (AASS). As consequence, modifications of this enzyme can imply different Lys efficiency and requirement.

AIM

The study aimed to evaluate the AA concentration in tissues of weaned piglets with different genotype for AASS and fed diets differing for Leu level (SID Leu:Lys).

RESULTS

AASS genotype did not affect AAs level in any tissue. No differences in AAs level were seen between the groups in plasma at d7 and in saliva.

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**Plasma d21- 2 weeks of trial**

**Plasma d28- 3 weeks of trial**

**Liver d 28- 3 weeks of trial**

**Urine d 28- 3 weeks of trial**

**Muscle d 28- 3 weeks of trial**

**Body weight classes – 1° week**

- **Heavy kg:** 10.5 SEM: 0.193
- **Light kg:** 7.8 SEM: 0.201

- **At 130% SID Leu:Lys, plasma Leu level was higher for heavy pigs than for light pigs (P < 0.001)**
- **No differences in the other AA levels**

**CONCLUSIONS**

- **Hight Leu deficiency (70% SID Leu:Lys) led to an increasing blood level of several dispensable and indispensable AA, probably due to a reduction in body protein synthesis** as consequence of insufficient supply of Leu and responsible for AA accumulation in the plasma, given its role as essential AA.
- **Over-supply of Leu (115 and 130% SID Leu:Lys) strongly decreased plasma Val and Ile levels with no effect on feed intake, since their catabolism increases as Leu level increases, negatively affecting their availability.**
- **Leu basal endogenous losses maybe higher in light than heavy pigs: this might explain no more increase of plasma Leu over 115% (SID Leu:Lys) in light pigs.**