

GROWTH PERFORMANCE AND NITROGEN UTILISATION OF GROWER-FINISHER PIGS FED DIETS SUPPLEMENTED WITH A FUNGAL FERMENTATION BY-PRODUCT

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BACKGROUND & OBJECTIVE

- Despite the use of highly digestible feedstuffs, less than 45% of the dietary nitrogen (N) is converted into lean meat by grower-finisher pigs
- Excess dietary N is excreted via faeces and urine contributing to anthropogenic N emissions, i.e., nitrates, ammonia, and nitrous oxide, highlighting the need to improve nitrogen utilisation efficiency (NUE) in pig production
- Aim: to compare the growth performance and NUE of grower-finisher pigs fed either a standard or a low crude protein (CP) diet, supplemented with a fungal fermentation by-product (Ceravital XP)

MATERIAL & METHODS

- Three feeding trials with each 400 growing pigs (Danbred × Duroc; initial body weight 30.2 kg) assigned to 16 pens across two separate barn compartments; 8 replicates per treatment
- 77-d fattening period with 3-phase feeding of barley-wheat-corn based diets provided as liquid feed according to the growth curve:
 - Grower I (30 – 60 kg mean body weight)
 - Grower II (60 – 90 kg mean body weight)
 - Finisher (> 90 kg mean body weight)
- Formulation of isoenergetic control and treatment diets based on the concentration of prececal digestible (pcd) amino acids using matrix values for Ceravital XP, resulting in a 1% CP reduction in the treatment diets by replacing 3% soybean meal with corn:
 - Grower I: 17.1% vs. 16.1% CP; 1.07% vs. 1.06% pcd Lys
 - Grower II: 15.2% vs. 14.2% CP; 0.88% vs. 0.87% pcd Lys
 - Finisher: 14.3% vs. 13.3% CP; 0.83% vs. 0.82% pcd Lys
- No additional supplementation of crystalline amino acids in the treatment diets
- Recorded traits:
 - Average daily gain (ADG)
 - Feed conversion ratio (FCR)
 - Carcass classification
 - NUE (calculated based on carcass data)
 - Airborne ammonia concentration
- Data were analysed by one-way ANOVA

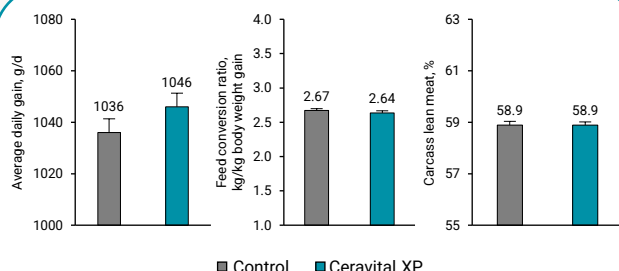


Figure 1. Effect of the inclusion of Ceravital XP in low crude protein diets on average daily gain, feed conversion ratio, and lean meat percentage of grower-finisher pigs. Data are expressed as LS means + SEM (n = 600; P > 0.05).

RESULTS

The meta-analysis of the three trials showed that a 1% reduction in dietary CP, when supplemented with Ceravital XP, resulted in:

- no differences in ADG, FCR, and carcass lean meat (P > 0.05; Figure 1)
- 10% greater calculated NUE (P = 0.420; Figure 2)
- 13% lower calculated N excretion (2.65 vs. 2.30 kg per pig; P = 0.339)
- 17% lower airborne ammonia concentration (P = 0.001; Figure 2)

CONCLUSION

- Supplementing grower-finisher pig diets with Ceravital XP maintained growth performance despite reduced dietary CP concentrations, indicating improved nutrient availability, especially amino acids
- Reduction of ammonia emissions and the potential for improved NUE indicate that the by-product of fungal solid-state fermentation is a promising functional feed ingredient for improving sustainability of pig production and reducing reliance on highly digestible protein sources

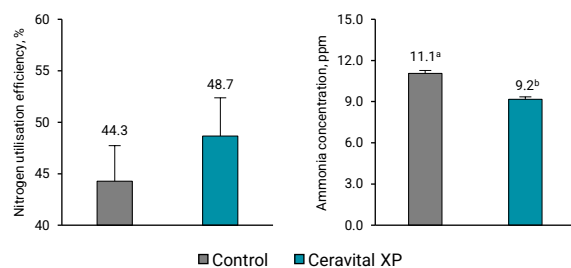


Figure 2. Effect of the inclusion of Ceravital XP in low crude protein diets on nitrogen utilisation efficiency of grower-finisher pigs (n = 3; P = 0.420) and airborne ammonia concentration (n = 3; P < 0.001). Data are expressed as LS means + SEM.

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