

# Low protein diets maintain performance and reduce greenhouse gas production in finisher pigs

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Greenhouse gases (GHG) are believed to contribute to global climate change. Our objective was to study the effect of decreasing dietary protein intake on the performance and GHG production by finisher pigs.

Twelve pigs of 68kg (SE 2) were fed conventional (HP) and protein-reduced, amino acid supplemented diets (LP) based on wheat, barley and soybean meal in a cross-over design. The diets were equalized on true availability for lysine, methionine + cystine, threonine and tryptophan. The protein contents were 19.3% (HP) and 16.0% (LP). After N-balance over 7d, CO<sub>2</sub>-, CH<sub>4</sub>- and heat production and O<sub>2</sub> consumption were measured over a 4h period using an open-circuit respiration system.

Daily gain (784 g/d, SE 23), nutrient digestibility and protein retention (182g/d, SE 5) were not affected ( $p > 0.2$ ) by diet composition. N excretion was lower ( $p = 0.001$ ) by 24% in LP due to a 29% reduction ( $p = 0.001$ ) in urinary N excretion. CO<sub>2</sub>, heat production and O<sub>2</sub> consumption were reduced ( $p > 0.4$ ) in LP by 3.8% and 7.0%, respectively. CH<sub>4</sub> production was lower ( $p = 0.05$ ) in LP by 27.3%. Assuming the excreted N is fully converted to N<sub>2</sub>O, the reduction in N excretion would reduce the CO<sub>2</sub> equivalent by 19.9% ( $p = 0.001$ ) when feeding the LP diet.

## **Implications:**

GHG production by finishing pigs can be reduced by at least 25% by feeding amino acid supplemented low-protein diets. This is accomplished by decreasing CO<sub>2</sub> (3.8%), CH<sub>4</sub> (27.3%), and nitrogen excretion (24%).

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