

Lysine requirements of pigs divergent in breeding value for nitrogen efficiency

L. Verschuren¹, S. L. Thingnes², J. Merkesvik³, K. Hov Martinsen², R. Bergsma¹, E. Grindflek²

¹ Topigs Norsvin Research Center B.V., Meerendonkweg 25, 5216 TZ 's-Hertogenbosch, Netherlands, ² Norsvin Research SA, Storhamargata 44, 2317 Hamar, Norway, ³ NMBU, Universitetstunet 3, 1433 Ås, Norway

This study aimed to relate the Lysine content of the feed to the performance of pigs genetically divergent for nitrogen efficiency. From 40 litters over two batches, 120 three-way crossbred female grower-finisher pigs were grouped by high or low breeding value for nitrogen efficiency. In each group, pigs were assigned to three dietary treatments in a two-phase feeding program: low (8.4 g/kg Lys – 7.1 g/kg Lys), medium (9.0 g/kg Lys – 8.4 g/kg Lys), or high (9.5 g/kg Lys – 9.0 g/kg Lys) protein content. All diets had an equal mineral, vitamin, and energy level (9.59 MJ NE/kg). Pigs were offered feed ad libitum and individual feed intake was recorded. BW's were recorded at the start of the trial (37 ± 5 kg), before feed change (74 ± 7 kg), and at the end of the trial (121 ± 22 kg). ADG was 1040 ± 89 g/d during the first phase and 1154 ± 145 g/d during the second phase. ADG increased with 24 g/day for every extra g/kg Lys in the diet during the first feeding phase with no difference between the breeding value groups ($P=0.760$). ADG increased with 18 g/day for every extra g/kg Lys during the second feeding phase, and animals with a low breeding value for nitrogen efficiency grew on average 45 g/day less than animals with a high breeding value at similar Lys intake ($P=0.017$). The data did not show an optimum dietary Lys content for ADG, but rather indicated a linear increase in ADG with increased Lys intake beyond the levels tested in this experiment. Hence, this experiment showed that breeding for improved nitrogen efficiency will result in increased ADG at similar Lys intake and that the genetic potential for ADG might be higher than commercial levels of dietary Lys will attain. This study was part of the 3D'Omics project, funded from the EU's H2020 Program under grant agreement no 101000309.

Presenting author: Lisanne Verschuren lisanne.verschuren@topignorsvin.com

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