The effect of feeding diets differing in composition and protein quality on growth performance and fecal consistency in weaned piglets

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Background and objectives

There is a growing interest to find alternative feeding concepts for a successful weaning of piglets while preventing the need of medical treatments such as therapeutic zinc oxide. The aim of this study was to investigate the impact of different dietary concepts on feces consistency and zootechnical performance. A special focus was on testing a hydrolysed yeast based on *Kluyveromyces fragilis* as a novel and protein-rich feedstuff in weaner diets.

Material and methods

Weaned piglets (DanBreed x Duroc, d 25 of age, Ø7.5 kg body weight [BW]) were divided into 5 treatment groups (*n*=10, 10 piglets per pen, ♂ + ♀). Differently composed pre-starter diets were fed from d 1 - 14. Piglets in control group received the standard feeding program (pre-starter: 13.8 MJ ME, 18.0 % CP, 1.45 % Lys) based on soybean meal (SBM), which was routinely fed at the trial farm. The other 4 treatment groups were fed pre-starter of slightly different composition to the SBM-diet (14.4 MJ ME, 17.6 % CP, 1.44 % Lys) and including only high-quality protein sources such as soyprotein concentrate (SPC), 3% blood plasma (BP), 1% hydrolysed yeast (HY) or a combination of 2% BP + 1% HY. The tested hydrolysed yeast was based on *Kluyveromyces fragilis* (TechnoYeast, Biochem) and is known to positively influence feed intake and gut maturation in weaned piglets (Keimer et al., 2018). After pre-starter feeding, all treatment groups received the same starter diet from d 15 - 42 (13.4 MJ ME, 16.8 % CP, 1.27 % Lys), whereby SBM-group received the routinely fed standard starter (13.6 MJ ME, 17.0 % CP, 1.30 % Lys). Following parameters were measured: average daily feed intake (ADFI); BW at start, d 14, d 28, d 42; average daily weight gain (ADWG); FCR and fecal score (1=well-formed, 2=soft, 3=pasty, 4=watery).

Results

In first wk (d 1-7), first period (d 1-14) as well as in total period (d 1-42) fecal scores were improved in piglets fed high-quality pre-starter compared with piglets fed SBM-diet (wk 1: 2.1 vs. 1.1; period 1: 1.8 vs. 1.0; total period 1.4 vs. 1.0, $P<0.05$). However, worse fecal scores in SBM-fed piglets showed no clinical relevance. BW at d 14 averaged 10.57 ± 1.16 kg without differences between treatment groups. BW at d 28 tended to differ between treatment groups (SBM 17.47 ± 1.61, SBC 17.01 ± 1.26, BP 17.34 ± 1.95, HY 18.35 ± 2.07 and BP+TY 17.49 ± 1.72 kg, $P<0.1$). A significant difference in final BW was observed between groups SBM and HY (26.86 ± 2.47 vs. 28.97 ± 2.66 kg, $P<0.05$), whereby BW in groups SPC, BP and BP+HY averaged 28.21 ± 2.58 kg and tended to differ from SBM ($P<0.1$). All piglets showed high feed intake after weaning without significant differences between treatment groups (236 ± 55 g per piglet/day). After feed shift on d 15, higher feed intake was observed in HY-group. ADWG from d 1 - 42 was higher in group HY compared with SBM. Furthermore, piglets fed HY-supplemented diets tended to have higher ADWG compared with all other treatment groups. FCR from d 1 - 14 was equal in all treatment groups (1.15 ± 0.08). After feed shift at d 15 - 28 and during total trial period, piglets from groups BP or HY showed improved FCR compared with piglets from groups SBM or SPC.

Conclusion and discussion

High-quality feeding concepts (SPC, BP, HY, BP+HY) showed better feces consistency and zootechnical performance compared to the low-quality feeding concept (SBM). Within the high-quality feeding concepts, in HY-fed piglets the best effects on fecal consistency and feed intake before and after feed shift were observed, which may indicate an improved gut maturity. In conclusion, the use of high-quality diets including functional components such as hydrolysed yeast should be considered when searching for alternative and preventive feeding concepts for weaned piglets.

References

Keimer et al., 2018, J. Anim. Sci. 96: 194-205, doi:10.1093/jas/skx031