**Application**

The financial cost of post-weaning piglet diets could be reduced by feeding lower specification and lower quality diets, in healthy pigs. Lower FCR immediately post-weaning of pigs with high pre-weaning creep consumption demonstrates the importance of maximising creep intake.

**Introduction**

High-quality diets are commonly fed to pigs during the initial period post-weaning to ease the transition from sows’ milk to solid feed, but they are expensive (Muns and Magowan, 2018). They contain a high proportion of highly digestible protein from animal sources, such as fishmeal and milk powder, and lower proportion of soya, which may have inflammatory effects on the intestine. Due to the zinc oxide ban, reduction in crude protein level is utilised as a strategy to reduce the risk of post-weaning diarrhoea resulting from microbial fermentation of excess undigested protein in the small intestine (Batson *et al.,* 2021), but risks under-supplying protein. The aim of this study was to determine whether level of pre-weaning creep consumption affected post-weaning performance when pigs were fed diets with differing lysine levels (specification) and diet quality.

**Materials and Methods**

Piglets from 56 litters equally spread between two batches farrowing six week apart were utilised. Piglets had *ad libitum* access to standard commercial creep from 14 days prior to weaning (wn-14), until weaning. Creep was provided through a single-space hopper, and consumption was quantified using the PigTrack® system (Asserva, France). The electronic ID (EID) tag of the piglet and duration of visit was recorded by an antenna each time it visited the creep feeder. Piglets were individually weighed on wn-7 and wn-1, and a creep score calculated as duration/ADG, designed to differentiate the contribution of creep to the individual piglet’s nutrient intake. Piglets were ranked by creep score into low (first quartile; CL) and high (third quartile; CH), then allocated a post-weaning two-stage dietary regime of low or high specification (SL, SH) and low or high quality (QL, QH). Specification was differentiated by lysine level, with SL conforming to minimum requirements as recommended by Whittemore *et al.* (2003) and SH had 1.5 g/kg higher lysine for each stage. Amino acid balance relative to lysine was maintained across diets. Low quality diets had a lower proportion of milk protein, cooked cereals and fishmeal, but higher proportion of raw cereals and soya. The SLQH regime was considered as equivalent to an industry-standard commercial regime. After day 22, a common grower diet was fed to all pigs to day 54 (nursery exit). At weaning, pens of six pigs were established, with variation in average pig weight minimised between pens, but difference in weight due to pre-weaning creep consumption was maintained. Pigs were weighed and pen feed intake recorded on day 3, 6, 9, 12, 15, 22, 36 and 54. Pen performance from weaning to day 54 post-weaning was analysed by ANOVA (Genstat 23rd edition, UK). Where a repeated measures model was utilised, deviance and Akaike Information Criterion were utilised to select the most appropriate model. Significant differences between treatments were determined by *post-hoc* Bonferroni test.

**Results**

Weaning weight of pigs classified as CH (8.97 kg) was lower than CL (9.27 kg, *P* <0.001, s.e.m =0.011), but there was no difference in weight at nursery exit on day 54 (43.3 kg, *P* =0.899, s.e.m =0.38). For CH pigs, ADFI and ADG were higher from weaning until day 12 post-weaning, and FCR was lower from weaning until day 9 post-weaning (*P* <0.05), than CL pigs. There was no three-way interaction on any performance parameters measured (*P* >0.05) to day 22 (end of experimental diets) or 54 post-weaning. Pigs fed SLQH were lightest at day 22 (*P* =0.003; Figure 1), and day 54 (*P* =0.025).

Figure 1: Effect of low (L) or high (H) diet specification (S)\*diet quality (Q) on pig weight from weaning-day 22 post-weaning. Error bars denote pooled s.e.m, antedependence order 1 with additional uniform correlations within subject.

Pigs fed SLQH had highest FCR and lowest ADG from weaning-day 9 and day 9-22 (Table 1).

Table 1: Effect of low (L) or high (H) diet specification (S) and diet quality (Q) on post-weaning performance of pigs.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | SLQL | SLQH | SHQL | SHQH | s.e.m | *P*-value |
| ADFI wean-d9 (kg/d) | 0.22 | 0.21 | 0.24 | 0.22 | 0.009 | 0.149 |
| ADFI d9-22 (kg/d) | 0.60 | 0.56 | 0.59 | 0.58 | 0.012 | 0.205 |
| ADG wean-d9 (g/d) | 160ab | 129a | 189b | 153ab | 12.1 | 0.011 |
| ADG d9-22 (g/d) | 476a | 420b | 485a | 475a | 16.9 | 0.037 |
| FCR wean-d9  | 1.50ab | 1.81a | 1.30b | 1.60ab | 0.111 | 0.017 |
| FCR d9-22 | 1.27ab | 1.37a | 1.23b | 1.24ab | 0.036 | 0.036 |

Superscripts denote significance at *P* <0.05.

The optimum regime in terms of cost of feed/kg pig post-weaning weight gain was SLQL.

**Conclusions**

Piglets classified as CH were probably lighter at weaning due to lower sow milk consumption than CL. Post-weaning dietary cost could be reduced by feeding lower quality diets with no adverse effects on nursery performance. There was no performance benefit to feeding diets with higher lysine levels.

**References**

Batson K.L., Calderón H.I., Tokach M.D., Woodwort J.C., Goodband R.D., Dritz S.S., DeRouchey J.M. (2021). Journal of Animal Science 99, 1-14.

Muns R., Magowan E. (2018). Journal of Animal Science 96, 3815-3823.

Whittemore C.T., Hazzeldine M.J., & Close W.H. (2003). Nutrient requirement standards for pigs. Penicuik: British Society of Animal Science.