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This study investigated the impact of feeding levels in late gestation on apparent total tract digestibility (ATTD) of gross energy (GE), nutrients and concentrations of plasma metabolites in transition sows. We hypothesized that nutrient digestibility decline and concentrations of plasma metabolites increase with increasing feeding levels. Forty-eight sows were assigned to six feeding levels (1.8, 2.4, 3.1, 3.7, 4.3 and 5.0 kg/d) from day 108 of gestation until farrowing. Faecal samples were collected on day 114 of gestation, whereas plasma samples were collected at farrowing. Klason lignin measured as acid insoluble residues in the feed ingredients was used as an internal marker to estimate ATTD of GE and nutrients. Data were analysed using general linear mixed model by including feeding levels and parity as the fixed effects and sow as the random effect. Plasma concentrations of urea ($P < 0.001$), acetate ($P < 0.001$) and butyrate ($P < 0.001$) increased, whereas that of non-esterified fatty acids ($P < 0.001$) decreased linearly with increasing feeding level. The ATTD of GE ($P < 0.001$) and protein ($P < 0.001$) showed similar trends, in which ATTD were greatest at 1.8 and 2.4 kg/d, intermediate at 3.1 kg/d and lowest at ≥ 3.7 kg/d for both parameters. The ATTD of non-starch polysaccharides (NSP) was greatest at 2.4 and 3.1 kg/d, intermediate at 3.7 and 4.3 kg/d and lowest at 5.0 kg/d ($P < 0.001$). The ATTD of GE, fat and NSP were greater in sows than in gilts ($P < 0.001$). In conclusion, plasma concentrations of acetate, butyrate and urea increased with increasing feeding level, indicating increased fermentation and protein oxidation, whereas the decreased concentration of non-esterified fatty acids with increasing feeding level implied a reduced body reserve mobilization. Increased feeding level also decreased the ATTD of GE, protein and NSP but to different extents.

P62. Isoquinoline alkaloids impact intestinal health and function of weanling pigs fed diets formulated below amino acid requirements

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Isoquinoline alkaloids (IQ) are a phytogenic feed additive included in diets for swine to promote growth and intestinal health. An experiment tested the hypothesis that inclusion of IQ in diets for weanling pigs formulated below or at amino acid (AA) requirements improve intestinal health and growth performance of pigs. Two-hundred weanling pigs (6.11 ± 0.61 kg) were allotted to 4 dietary treatments with 5 pigs per pen and 10 replicate pens per treatment for a 27 d, 2-phase experiment. Diets were arranged in a 2 × 2 factorial with AA at or 10% below requirements and with IQ at 0 or 120 mg/kg feed. Growth performance was determined and faeces (d 14 and 26), and tissue samples (d 27) were collected. Data were analysed with a general linear mixed model using AA level, IQ inclusion, and the interaction as main effects and pen as random effect. Pigs fed diets with IQ tended to have greater ($P < 0.10$) ADFI, whereas G:F was reduced if dietary AA were reduced ($P < 0.05$). If diets contained adequate AA on d 14, IQ increased phenol in the faeces, whereas when diets with reduced AA were fed, IQ decreased phenol in the faeces (interaction, $P < 0.05$). If AA were at requirements, lamina propria in the jejunum was not affected by IQ inclusion, but if AA were below requirements, IQ decreased lamina propria thickness (interaction, $P < 0.05$). Jejunal villus height tended to increase ($P < 0.10$) with IQ regardless of dietary AA concentration. If AA were below requirements, IQ tended to increase occludin in the jejunal mucosa, whereas if AA were at requirements, IQ did not influence occludin expression (interaction, $P < 0.10$). In conclusion, if AA are provided below requirements, dietary IQ modulates intestinal function and faecal metabolite synthesis in weanling pigs.

P63. The (long-term) effects of providing creep feed to suckling piglets

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To prevent health problems after weaning, we should stimulate piglets more to learn to eat and digest dry feed before weaning. Providing a soft creep feed might be easier to eat than a regular hard pellet. In a trial 61 litters were assigned to three treatments (TRT). Before weaning,from day 4–21, these piglets received: CTRL (no feed before weaning), CF1 or CF2. CF1 was a regular 2 mm pellet, CF2 a very soft, star-shaped product. From day 22 till weaning (day 27) and after weaning, the three groups received the same feed. Per treatment 30–32 piglets were used to determine the fat and nitrogen digestibility by quantitatively collecting faeces and urine twice a day per pen. Most variables were statistically analysed using ANOVA model: Y = intercept + TRT. Only for the weights before weaning, birth weight was added in the model as covariable. Feed intake from day 4–21 was higher in CF2 vs CF1 (144 vs 249 g /piglet, $P < 0.01$). Also from day 4-weaning, the feed intake was higher ($P = 0.02$) in CF2 (552 g) than CF1 (410 g). CF1 (6.9 kg) and CF2 (6.9 kg) showed a higher ($P = 0.02$) weaning weight than CTRL (6.5 kg). After weaning, CF1 (633 g) and CF2 (654 g) showed a higher ($P < 0.01$) daily feed intake than CTRL (587). CF2 (26.6 kg) showed a higher ($P = 0.03$) weight at 36 post weaning than CTRL (24.7 kg). In the first week after weaning, the fat digestibility was improved ($P < 0.05$) in CF1 (73.5%) compared to CTRL (66.9%). Providing a (soft) creep feed before weaning significantly improved growth and feed digestibility after weaning.

P64. Lowering dietary Ca level increased digestible Ca and P released by phytase and bone P content in weaner pigs

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Calcium (Ca) can affect phytase efficacy and phosphorus (P) utilization. A 21-d trial with 144 weaned piglets (28-d old) was performed to investigate the effect of dietary Ca level on phytase efficacy in terms of growth performance, the digestible Ca and P released by phytase, and bone mineralization. The basal diet was based on corn, soybean meal and canola meal to contain 0.40% total P and 0.28% phytate P. Nine treatments were established by combining 3 total Ca levels (0.56, 0.64 and 0.78% on analysis) and 3 doses of phytase (0, 1,000 and 2,000 U/kg feed). Each treatment was replicated 4 times. Faecal samples were grabbed from individual pens to measure digestible Ca and P. Tibia samples were collected at the end of trial to analyse percentage bone ash, Ca, and P. The results showed that the interaction between dietary Ca level and phytase was only significant for bone P content due to significant increase in bone P content by added phytase only at the 2 lower dietary Ca levels. Phytase significantly increased weight gain and bone ash and