The impact of acute stressors on performance, histological parameters, and serum stress markers in weaned nursery pigs were evaluated. Pigs (6.21 ± 0.29 kg) were allotted in a randomized complete block design to 4 post-weaning treatments on the basis of body weight at the time of weaning. There were 8 pigs per pen and 12 replicate mixed-sex pens per treatment. The post-weaning treatments were arranged in a 2 x 2 factorial of 0 or 24-h feed deprivation period and 0 or 24-h water deprivation period after which the piglets were returned to normal management procedures. Growth performance was measured the day following the stressor, 7, 14, and 28 d post weaning. Serum and intestinal samples were taken d 2 and 7 post weaning. Serum was analyzed for cortisol and corticotrophin releasing factor, and villus height and crypt depth were measured in the jejunum and the ileum. There was a decrease in ADG with the water stressor (P < 0.01) immediately following the stressor although there was a significant improvement in ADG and feed efficiency (P < 0.01) at d 7 post weaning. Furthermore, there was a reduction in ADFI during the last 14 d of the trial and cumulatively (P < 0.05) in the water stress group. On d 7 post weaning, there was a reduction (P < 0.05) in jejunal crypt depth with the water stressor and a reduction (P = 0.05) in ileal villus height with the feed stressor. With administration of the water stressor there was an increase (P < 0.05) in serum cortisol and corticotrophin releasing factor 7 post weaning. There was no impact of the feed stressor or a feed x water stressor interaction on growth performance or any of the serum measurements. The results from the current trial show that an acute water stressor at the time of weaning has negative impacts on growth performance, histological measurements, and serum stress indicators not only immediately following the stress event but throughout the nursery period.

**Key Words:** acute stressors, nursery pig

**NONRUMINANT NUTRITION: NURSERY AND GROW-FINISH NUTRITION**

**P067** (GS-PHD)  Impact of an acute water and feed deprivation event on performance, histology, and stress markers in weaned pigs. N. Horn 1, F. Ruch 2, K. Ajuwon 1, G. Miller 1, O. Adeola 1, 1Animal Sciences, Purdue University, West Lafayette; 2Enzyvia, LLC, Sheridan, 3Biomatrix, Princeton.

Pigs (6.21 ± 0.29 kg) were allotted in a randomized complete block design to 4 post-weaning treatments on the basis of body weight at the time of weaning. There were 8 pigs per pen and 12 replicate mixed-sex pens per treatment. The post-weaning treatments were arranged in a 2 x 2 factorial of 0 or 24-h feed deprivation period and 0 or 24-h water deprivation period after which the piglets were returned to normal management procedures. Growth performance was measured the day following the stressor, 7, 14, and 28 d post weaning. Serum and intestinal samples were taken d 2 and 7 post weaning. Serum was analyzed for cortisol and corticotrophin releasing factor, and villus height and crypt depth were measured in the jejunum and the ileum. There was a decrease in ADG with the water stressor (P < 0.01) immediately following the stressor although there was a significant improvement in ADG and feed efficiency (P < 0.01) at d 7 post weaning. Furthermore, there was a reduction in ADFI during the last 14 d of the trial and cumulatively (P < 0.05) in the water stress group. On d 7 post weaning, there was a reduction (P < 0.05) in jejunal crypt depth with the water stressor and a reduction (P = 0.05) in ileal villus height with the feed stressor. With administration of the water stressor there was an increase (P < 0.05) in serum cortisol and corticotrophin releasing factor 7 post weaning. There was no impact of the feed stressor or a feed x water stressor interaction on growth performance or any of the serum measurements. The results from the current trial show that an acute water stressor at the time of weaning has negative impacts on growth performance, histological measurements, and serum stress indicators not only immediately following the stress event but throughout the nursery period.

**Key Words:** acute stressors, nursery pig

**P068** An evaluation of dietary natural zeolite or humic acid substances and high sulfate water on nursery pig performance. J. R. Flohr 1, M. D. Tokach, J. L. Nelssen, S. S. Dritz, J. M. DeRouchey, R. D. Goodband, Kansas State University, Manhattan.

A total of 675 pigs (initial BW 11.1 kg) were used in a 21-d study to determine the effects of varying ingredient particle size and diet form on nursery pig growth performance and caloric efficiency. Pens of pigs were balanced by initial BW and randomly allotted to 1 of 8 dietary treatments (17 pens/treatment). The 8 diets included 3 corn-soybean meal–based diets consisting of: 1) corn ground to 620 µ and fed in meal form, 2) corn ground to 352 µ and fed in meal form, and 3) diet 2 pelleted. The remaining 5 diets contained 20% wheat middlings (midds) and 30% dried distillers grains with solubles (DDGS). Diets 4 to 8 consisted of: 4) corn ground to 620 µ, midds and DDGS unground (534 and 701 µ), and fed in meal form; 5) diet 4 but corn also ground to 352 µ and fed in meal form; 6) diet 5 fed in pelleted form; 7) corn, soybean meal, DDGS, and midds finely ground (352, 421, 377, and 357 µ), and fed in meal form; and 8) diet 7 fed in pelleted form. Diets were not isoenergetic. Overall (d 0 to 21), pelleting improved (P<0.03) ADG, G:F, and caloric efficiency on a ME or NE basis. Reducing corn particle size did not influence G:F or caloric efficiency, but tended (P<0.08) to reduce ADFI, which led to a reduction (P<0.02) in ADG. High-by-product diets reduced (P<0.01) ADG, ADFI, final BW, and (P<0.01) G:F, but caloric efficiency was similar to pigs fed the corn-soybean meal–based diet. Grinding the by-products to a smaller particle size further reduced (P<0.05) ADG, ADFI, and final BW, but did not influence

**Key Words:** non-nutritive feed additives, nursery pig, sulfate water