90 Performance of lactating sows fed diets containing *Saccharomyces cerevisiae*.

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A total of 139 sows (avg parity = 3.91; 30 parity 1 sows and 109 multiparious sows) was blocked by parity and allotted to one of two treatments in a randomized complete block design. Treatments were: 1) Control diet (corn-SBM based diet containing 19% CP, 1.1% lysine and 8% fat) and 2) Control diet with 1.68 kg/ton of *Saccharomyces cerevisiae* (yeast) from Chr. Hansen Inc., Milwaukee, WI that provided 2 million CFU/g of feed. Dietary treatments were fed 7-10 d pre-farrowing until weaning at 18-d post-farrowing. A parity by treatment interaction was observed for number of pigs weaned ($P < .013$) and 21-d adjusted (adj) weaning weight (wt) ($P < .053$), with first parity sows fed yeast having fewer pigs weaned (8.62 vs 9.82; $P < .075$) and a greater 21-d adj weaning wt (6.41 vs 5.47 kg; $P < .007$) than first parity sows not fed yeast. Multiparous sows fed yeast had a greater number of pigs weaned (8.97 vs 8.25; $P < .044$), but had no differences in the 21-d adj weaning wt (6.46 vs 6.28 kg; $P > .327$) compared to multiparous sows not fed yeast. Across all parities, dietary treatment had no effect ($P > .17$) on the total number of pigs born, pigs born alive, pigs born dead, wt of pigs born dead or number of mummies. Supplementing yeast to lactation diets tended to increase the avg birth wt of pigs born (1.60 vs 1.51 kg; $P < .068$) and the avg birth wt of pigs born alive (1.61 vs 1.53 kg; $P < .078$). Pigs from sows fed yeast had a greater 21-d adj weaning wt (6.44 vs 5.87 kg; $P < .005$), but not 21-d adj litter wt (56.64 vs 52.72 kg; $P < .225$) compared to pigs from sows not fed yeast. Sows fed yeast had a greater ADG per pig (222 vs 196 g/d; $P < .007$) than sows not fed yeast. Dietary treatment had no effect on sow intake ($P > .874$), days to detection of first estrus ($P > .226$), sow body condition score, sow body weights or sow backfat depths at farrowing or weaning ($P > .35$). In summary, supplementing lactation diets with yeast resulted in better piglet ADG greater birth weights and greater 21-d adj weaning weights.

Key Words: Sows, Yeasts, Litter Weight

91 Kinetics of organic and inorganic zinc uptake in dogs.

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Studies indicate that organic sources of trace minerals have increased bioavailability over inorganic sources in both production and companion animals. The objective of this study was to measure the uptake kinetics of an organic (propionate) and inorganic (oxide) form of zinc in beagles in order to demonstrate relative differences in bioavailability. Immediately prior to the treatments, the dogs were fasted for 24 hours in order to remove food from the stomach and small intestine. At time 0, 5 ml of blood was drawn from each animal to obtain a baseline zinc plasma level. The dogs were then weighed. Five dogs were given a capsule containing 5.0 mg/kg bodyweight zinc oxide and five dogs were given a capsule containing 5.0 mg/kg zinc propionate. Samples of blood were then taken after 30 minutes, 1 h, 2 h, 3 h and 6 h. Blood plasma samples were analyzed for zinc content using flame atomic absorption spectroscopy. Zinc plasma levels were significantly greater one hour after supplementation for the dogs fed zinc propionate than zinc oxide (2.12 vs 0.60 mg/kg; $p<0.001$). Furthermore, dogs fed zinc from zinc propionate demonstrated significant blood clearance kinetics over the six hour period which was not evident from zinc oxide. These results clearly demonstrate a significant improvement in bioavailability in the propionate form of zinc compared to zinc oxide. Situations of increased physiological demand for trace minerals in companion animals and breed specific requirements would suggest a need for increased bioavailability.

Key Words: Dogs, Zinc

92 Effects of different management strategy and dietary spray-dried porcine plasma on early-wean pig performance and the occurrence of gastrointestinal hemolytic *Escherichia coli*.

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The benefits of segregated early-weaning (SEW) and feeding high-nutrient dense diets to early-weaned pigs is well documented. Whether an improvement in pig performance is obtained without having off-site nurseries but with implementation of strict bio-security measures is not known. The mechanism whereby spray-dried porcine plasma (SDPP) enhances growth performance of weaned pigs is also unknown. Objectives of this study were: (1) to compare three early-weaning management strategies (SEW, high bio-security on-site (HBOS), and low bio-security on-site continuous-flow nursery (LBOS), and (2) to determine if adding SDPP to a corn-soybean meal, milk diet influences pig performance and the presence of hemolytic *Escherichia coli (E. coli)* in the gastrointestinal (GI) tract. Three hundred and twenty-four crossbred pigs (3.8±0.7 kg and 12.1±1.8 d; mean±SD) were allotted by weight, sex, and litter to one of six treatments in a 3 × 2 factorial designed experiment. Factors were management strategies and the inclusion of SDPP (0 or 7.5%) in phase I and II diets fed during wk 1 and 2, respectively. All pigs received the same diets thereafter. Overall (d 0-49) ADFI, ADG and G/F were greater ($P < .01$) for the SEW treatment compared to HBOS and LBOS treatments (764, 683, 598 g; 0.414, 0.267, 0.265 kg; 0.54, 0.39, 0.44, respectively). Overall (d 0-49) ADFI, ADG and G/F did not differ ($P > .05$) between 0 or 7.5% SDPP dietary treatments. Diet by location interactions were not significant ($P > .05$). Sixteen pigs (per replication; one per pen) were killed at the end of wk 1. One g of digesta was collected from the stomach, ileum, jejunum, cecum and the large intestine, serially diluted, and streaked onto MacConkey Agar plates. Isolated *E. coli* colonies were streaked onto Blood Agar plates to determine if the *E. coli* populations were hemolytic. Hemolytic *E. coli* populations were present throughout the GI tract. Management strategy and SDPP were not related to the presence of hemolytic *E. coli*.

Key Words: Spray-Dried Porcine Plasma, Management, Nursery Pig

93 Evaluation of a high protein, whey protein concentrate and spray-dried animal plasma on growth performance of weanling pigs.

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A 35-d growth trial was conducted to investigate the effects of increasing spray-dried animal plasma and a high protein, whey protein concentrate (73% CP) on starter pig performance. One hundred eighty pigs, initially 5.8 kg and 21-d of age, were blocked by weight, equalized for sex and ancestry, and allotted randomly to one of five dietary treatments. Dietary treatments were based on a control diet containing dried skim milk, or the control diet with added spray-dried animal plasma (2.5 or 5.0%) or whey protein concentrate (2.7 or 5.4%) substituted for dried skim milk. Diets were formulated to contain 1.5% lysine and 17.5% lactose. Diets were fed from d 0 to 14 after weaning and a corn-soybean meal diet (1.35% lysine) was fed to all pigs from d 14 to 35. From day 0 to 7 after weaning, increasing spray-dried animal plasma increased ADG and ADFI (linear, $P<.01$). Increasing whey protein concentrate had no effect on ADG, ADFI, or G:F. From d 0 to 14 or 0 to 35 after weaning, protein source had no effect on ADG, ADFI, or G:F. Under our experimental conditions, increasing spray-dried animal plasma only improved growth performance from d 0 to 7 after weaning. Pigs fed increasing high protein whey protein concentrate had similar growth performance to those fed dried skim milk; however, high protein, whey protein concentrate can not replace spray-dried animal plasma for the initial period after weaning.

		Spray-dried animal plasma, %		Whey Protein concentrate, %		
Item	Control	2.5	5.0	2.7	5.4	CV
D 0 to 7						
ADG, g[a]	190	219	238	195	194	13.5
G:F	1.10	1.08	1.08	1.04	1.05	9.7

[a] Linear effect of animal plasma ($P<.01$).

Key Words: Pigs, Animal Plasma, Whey Protein Concentrate