326 Factors related to piglet pre-weaning mortality in a bedded group farrowing system. Y. Z. Li*, L. J. Johnston, and A. M. Hilbrands, *University of Minnesota*, *Morris*.

Recently there has been increased interest in loose farrowing systems in North America due to sow welfare concerns. However, piglet mortalities of 25 to 33% have been reported in these systems. We investigated factors related to piglet mortality in a group farrowing system. A total of 156 sows (Landrace x Yorkshire) in parity 0 to 5 and their litters were studied in three farrowing rooms. All sows were group housed during gestation, and moved to the farrowing room one wk before expected farrowing dates. Each farrowing room (9.6 x 10.8 m) was equipped with eight straw-bedded, 'get-away' pens (2.4 x 3.0 m) to accommodate eight sows and their litters. A communal eating/drinking/dunging area was provided in each room. The pens were removed about d 10 post farrowing, so sows and their litters mingled in a group. Minimal cross fostering was conducted within 2 d of farrowing. Piglets were weaned at 28 to 36 d of age. The PROC MIXED procedure of SAS was used to analyze effects of sire breed (Yorkshire vs Landrace) of the sows, sire breed (Duroc, Yorkshire vs Landrace) of the litter, birth location of the sows (group vs crate), previous farrowing location (group vs crate), and sow parity on total born, live born, number of piglets nursed and weaned, and piglet mortality. Overall pre-weaning mortality of piglets was 26%. Piglet mortality increased with increasing sow parity (from Parity 0 = 22.4 ± 3.11% to Parity 3~5 = 33.7 ± 3.92%; $P = 0.04$), which was coincident with increasing litter size (from Parity 0 = 12.5 ± 0.53 to Parity 3~5 = 15.0 ± 0.65 total piglets born/litter; $P = 0.01$). Piglet mortality was greater for Landrace-sired sows compared with Yorkshire-sired sows (27.5 ± 2.45 vs 23.5 ± 2.37 %; $P = 0.05$), possibly due to the larger litter size of Landrace-sired sows ($P = 0.05$). There was a positive correlation ($R^2 = 0.89$, $P < 0.01$) between number of piglets nursed and piglet mortality. Sire breed of the litter, sow birth place, and previous farrowing location did not affect piglet mortality. In the current study litter size at farrowing appeared to be the primary factor influencing piglet mortality in a bedded, group farrowing system.

Key Words: Piglet mortality, Group farrowing

327 Impact of gestation housing system on weaned pig production costs. P. J. Lammers* and M. S. Honeyman, *Iowa State University*, *Ames*.

Construction and operating costs for two gestation housing systems—1) individual gestation stalls in a mechanically ventilated confinement building with slatted floor (C) and 2) group pens with individual feed stalls in deep-bedded naturally ventilated hoop barns (H) were compared. Cost comparisons were based on previous reports that reproductive performance of group-housed sows in hoop barns is equal or better than for individually stalled sows, in that sows housed in hoop barns for gestation farrowed 0.7 more (P = 0.002) live pigs per litter and had equal (P = 0.66) pre-wean mortality rates as sows housed in individual gestation stalls. All litters were farrowed in a mechanically ventilated building with raised farrowing crates. No bedding was used during farrowing or by the C sows during gestation. For the last trimester of pregnancy and in winter months, feed allowance was increased for both gestation housing systems. During the winter, H sows received 20% more feed then C sows. Lactating sows were fed ad libitum. It is assumed that feed consumption was equal during lactation for both housing systems. In a one-year period, C sows received 93% of the feed that H sows were fed during gestation and lactation. Hoop barn gestation facilities can be constructed for 67.7% of the cost of typical confinement facilities with gestation stalls. Fuel and electricity use in mechanically ventilated gestation buildings is greater then utility use in hoop barns, although bedding costs only occur in bedded systems. Assuming equal prolificacy, feed cost per pig weaned is more for sows housed in hoop barns. Total cost per pig weaned is less for sows housed as groups in hoop barns compared to individual stall confinement systems. When observed production differences were included in the cost analysis, the group housing in hoop barns resulted in a weaned pig cost that was 11% less then the cost of a weaned pig from the individual stall confinement system. Group housing of gestation sows in deep-bedded hoop barns may produce pigs at a lower cost than individual gestation stalls in confinement facilities.

Key Words: Gestation housing systems, Weaned pig production cost

328 Effects of physiological traits on weaning-to-estrous interval in first-litter gilts. Y. Wang*[1], T. Wise[2], G. Rohrer[2], K. Hanford[1], and D. Van Vleck[2], [1]*University of Nebraska*, *Lincoln*, [2]*U.S. Meat Animal Research Center*, *Clay Center, NE*.

Delayed return to estrus after weaning is a significant problem for swine producers. We investigated relationships among weaning-to-estrous interval (WEI) and body weight (BW), backfat (BF), plasma leptin (L), choline (C), glucose (G), albumin (A) and litter traits to identify physiological traits associated with WEI. Data were from sows in 2002 and 2003 prior to farrowing (f, 110 d gestation), at weaning (w) and at first estrus (e) after weaning. In 2001, Yorkshire-Landrace sows were crossed with Duroc or Landrace boars to establish two lines. Sows from these two crosses farrowed in 2002 (n=247). The cross of the two crosses farrowed in 2003 (n=228). Separate analyses by year showed that WEI was positively associated with Le or with Le*Lw, and was negatively associated with Ae ($p<0.05$). At f, w and e, BF was positively associated with L and A ($p<0.05$). Correlations were positive between changes in BW and L between f, w and e ($p<0.05$). With WEI classified as early/normal (1-10 d, EI), late (11-20 d, LI), very late (>20 d, VI) and no estrus (NI), stepwise logistic regression was used to generate models with reduced sets of traits to discriminate between pairs of populations: EI vs. LI+VI+NI (M1), EI+LI vs. VI+NI (M2), EI+LI+VI vs. NI (M3), EI vs. LI+VI (M4), EI +LI vs. VI (M5). M1, 2, 3 included traits through weaning, M4, 5 included all traits. For 2002 farrowing gilts, number of pigs weaned in litter (NWL), Lw had significant effects with M1. With M2, effects of Aw, NWL were significant. With M3, Lw, NWL and number of pigs born (NB) had greatest effects. With M4, Ae, NWL had significant effects. With M5, Ae had greatest effect. For 2003 farrowing gilts, BWe-BWw, number of pigs alive at birth (NAB), Cw and Aw had significant effects with M1. With M2 and M3, BW, Aw were significant, respectively. With M4, BWe-BWw, NAB and Ae had significant effects. With M5, Le, BWe-BWw, BFw, Aw-Af had greatest effects. These results suggest there are metabolic components associated with WEI that may have a genetic basis.

Key Words: Swine, Estrus, Reproduction

329 Influence of a phytogenic feed additive on performance of weaner piglets. A. Kroismayr*[1,3], T. Steiner[1], and C. Zhang[2], [1]*Biomin GmbH*, *Herzogenburg, Austria*, [2]*Biomin Feed Additive Co. Ltd*, *Shanghai, China*, [3]*University of Natural Resources and Applied Life Sciences*, *Vienna, Austria*.

This study was carried out to investigate the effect of a combination of essential oils and FOS (Biomin® P.E.P.) on performance parameters in piglets. 120 crossbred (Duroc x Landrace x Yorkshire) piglets, weaned at 23 d of age, were randomly assigned to two dietary treatments, comprising five replicates per treatment with twelve piglets per replicate. Piglets were fed ad libitum a commercial weaner diet based on corn and soybean meal, either supplemented or not supplemented with a phytogenic additive (Biomin®P.E.P., 125 g/t). Individual body weight (BW) of the piglets and pen feed consumption were recorded every 14 d and after the conclusion of the experiment. Data were subjected to ANOVA using SPSS software. During the first two weeks of the experiment, there were no treatment effects ($P>0.05$) on BW of the piglets (Table 1). However, from day 28 until the conclusion of the experiment, pigs fed the diet supplemented with the phytogenic feed additive were heavier ($P<0.05$) compared to pigs fed the control diet. Furthermore, supplementation of the basal diet with the phytogenic additive increased ($P<0.05$) pen feed intake by 10 % from trial day 1 to 50. Finally, Biomin® P.E.P. supplementation tended ($P<0.1$) to lower feed conversion ratio, measured from day 0 to 28 and 0 to 42, respectively. The data shows that the investigated phytogenic feed additive enhanced feed intake and growth performance. These data are consistent with the results of GOESSLING (2001) and KROISMAYR (2005). Furthermore, supplementation of diets with the same additive tended to improve feed conversion as reported by STONI (2005). The investigated phytogenic feed additive (Biomin® P.E.P.) had a positive influence on performance of weaner piglets.

References

1. Goessling, A. (2001). PhD thesis, Hannover, Germany.

2. Stoni, A. et al. (2005). 4. BOKU Symposium, Vienna, Austria, pp. 147 to 153.

3. Kroismayr, A. et al. (2005). 4. BOKU Symposium, Vienna, Austria, pp. 140 to 146.

Table 1 Effect of Biomin® P.E.P. on body weight (kg)

	Control	Biomin® P.E.P.	P value
Weaning	6.4±0.05	6.4±0.07	0.891
14 d	9.5±0.21	9.8±0.16	0.237
28 d	14.7±0.64	16.3±0.30	0.035
42 d	21.9±0.85	24.2±0.46	0.025
50 d	26.1±1.02	29.2±0.52	0.013

Key Words: Piglet nutrition, Essential oils, Phytogenic feed additive

330 Liquid feeding of newly weaned pigs using whey permeate. T. D. Woods*, C. Zhu, E. Jeaurond, and C. F. M. de Lange, *University of Guelph*, *Ontario, Canada*.

Liquid feeding can reduce post-weaning growth lag in pigs and allows the use of liquid feed ingredients. A total of 378 newly-weaned purebred Yorkshire piglets (14-16 pigs per pen; initial BW 5.8 kg) were assigned to one of three treatments (8 pens per treatment): conventional ad libitum feeding of crumbled dry feed (Dry), liquid feeding of the crumbled dry feed (Liq), and liquid feeding whereby the whey present in the dry feeds was replaced with liquid whey permeate (LiqWhey). Pigs were fed according to a three phase feeding program. In Dry the three subsequent diets contained 20, 10 and 0 % whey. Whey permeate contained 35% DM and 4.8% CP within DM. Within LiqWhey, the inclusion level of whey permeate was kept constant at 20% of DM (4 pens; LiqWheyFix) or reduced from 20 to 10 and 0% of DM in the subsequent diets (4 pens; LiqWheyVar). Between phases, feed was changed gradually on days 8 to 11 and 27 to 30 post-weaning. Liquid fed pigs were fed 6 times daily (28% DM; 6, 9, 12, 15, 18, 21 h) using a computer-controlled liquid feeding system that only delivered meals when the trough was empty. During week 1, ADG (99 ± 10, 87 ± 9, 95 ± 11 g/d for Dry, Liq and LiqWhey, respectively) did not differ between treatments ($P > 0.10$), while F:G was better ($P < 0.05$) for Dry than LiqWhey (1.57 ± 0.21 vs. 2.09 ± 0.22; $P < 0.05$) and intermediate for Liq (1.94 ± 0.21). During week 5 and 6, treatment did not influence ($P > 0.10$) ADG (616 ± 55, 541 ± 57, 509 ± 107, 616 ± 58 g/d for Dry, Liq, LiqWheyVar and LiqWheyFix, respectively) and F:G (1.50 ± 0.31, 1.37 ± 0.30, 1.53 ± 0.48, 1.20 ± 0.25, for respective treatments). Also over the entire 6 week post-weaning period, treatment did not influence ADG (399 ± 26, 334 ± 27, 331 ± 51, and 377 ± 27 g/d; $P > 0.07$) and F:G (1.41 ± 0.14, 1.50 ± 0.14, 1.53 ± 0.27, 1.42 ± 0.14; $P > 0.10$). Liquid feeding did not enhance growth performance of weaned piglets, likely because of feed intake restriction. Liquid whey permeate represents an effective alternative for dry whey in diets for weaned pigs.

ADSA Southern Section Symposium: Practical and Applied Approaches to Managing Dairy Businesses in the Future

331 Labor management strategies in the next decade. D. C. Grusenmeyer*, *New York Farm Viability Institute*, *Syracuse, NY*.

Agricultural labor needs span a broad spectrum from hand labor to highly technical expertise and from production management to strategic business planning and finance. The first step in developing a labor management strategy for the next decade is envisioning who the labor force will be. Agriculture will increasingly depend on foreign labor, for the next decade primarily Hispanic, to fill a wide array of positions. Also, with the Graying of America and people staying in the workforce longer, there will be a wider age range in the workplace. Over the coming decade managers will have as many as three or four generations working in their business at the same time. The result will