

## Swine Species

**W454 Effect of a basal creep feed diet modification on the preferences in pre-weaning piglets.** J. Figueroa\*<sup>1</sup>, D. Solà-Oriol<sup>1</sup>, X. Manteca<sup>1</sup>, C. Chetrit<sup>2</sup>, and J. F. Pérez<sup>1</sup>, <sup>1</sup>*Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain*, <sup>2</sup>*Bioibérica SA, Barcelona, Spain*.

Oronasal and postingestive experience play an important role in creep feeding intake. The aim of the present trial was to study the effect of basal creep feed diet modifications on creep-feed preference in sucking piglets. A total of 80 litters (10-12 piglets/sow) were used in a 6-day double choice-feeding test (DCFT) (22 to 28d-old piglets). The preference for 4 different modified diets was compared with that for a simple diet (CT) by using a DCFT. The CT diet included corn, barley and wheat (54.7%), sweet whey (14.12%), soybean protein concentrate (16.6%) and spray dried porcine plasma (5%). The modified diets included the flavored commercial creep-feed diet (COM) commonly used on the farm, and 3 different modifications of the CT diet, based on the incorporation of garlic flavor (0.075%, GAR) or the replacement of soybean meal by porcine digestible peptides (1.5%, PDP, Palbio 50RD), and of soybean oil by a intestinal porcine fat (TIFat). Choice feeding test was conducted in the farrowing pens by using two small creep-feeders containing the two diets (side by side). Feeds were offered ad libitum in mash form. Preference was calculated as the percentage contribution of the test diet to the total creep feed intake. Litters showed a total creep feed intake of 476 g/d (SD 267 g/d). Preference values for PDP diet (50.1%) or TIFat diet (60.0%,  $P=0.074$ ) were not significantly different from CT. CT diet was significantly preferred to the GAR diet (40.9%,  $P < 0.01$ ) and the current COM diet (36.1%,  $P < 0.001$ ). Our results suggest that the addition of new flavors or ingredients may affect the palatability of piglet's creep feed diets. Piglets showed a preference for simple diets and neophobia or innate aversion to new flavors.

**Key Words:** palatability, choice-feeding, creep feed

**W455 Nutritional value of Brazilian crude glycerol and semi-purified glycerol on starting pigs diets.** I. Moreira\*, P. L. de Oliveira Carvalho, L. M. Piano, J. B. Toledo, A. C. Furlan, C. de L. C. Filho, and T. M. P. da Cruz, *Universidade Estadual de Maringá, Maringá, Paraná, Brazil*.

One experiment was carried out to determine the nutritional value of four different types of glycerol. Two different types of crude glycerol from soybean oil (CGS), and animal fat + soybean oil (CGA), and two different types of semi-purified glycerol from soybean oil (SPGS), and animal fat + soybean oil (SPGA) were used. Glycerol is the main co-products of biodiesel production (esterification technologies using vegetable oil or animal fat). Gross energy (kcal/kg) of CGS, CGA, SPGS, and SPGA (as-fed basis) were 5,247; 5,242; 3,760; and, 3,217 respectively. A digestibility trial using 56 crossbred barrows with  $19.20 \pm 1.52$  kg of initial body weight was conducted. The trial consisted of a randomized experimental design ( $4 \times 3$  factorial scheme) with four different types of glycerol and three levels of glycerol in the diet. Four experimental units (one pig) per diet were used. Glycerol levels used in the digestibility trial were 4%, 8%, and 12% of the basal diet (corn + soybean based) calculated according to NRC (1998). The digestibility coefficient (%) values of four different types of glycerol were: dry matter (CGS = 93.10, CGA = 80.55, SPGS = 95.87, SPGA = 89.44); organic matter (CGS = 90.27, CGA = 89.05, SPGS = 106.87, SPGA = 100.89); gross energy (CGS = 96.60, CGA = 98.11, SPGS = 100.88, SPGA = 100.09); metabolization coefficient of gross energy (CGS = 87.54, CGA = 85.98, SPGS = 89.69, SPGA = 91.15). The digestible

(DE) and metabolizable energy (ME) values of glycerol were estimated by regression (Adeola, 2001) of DE and ME intake vs. glycerol intake. The values (as-fed basis) of DE and ME (kcal/kg) obtained were: CGS = 5,070 and 4,593; CGA = 5,143 and 4,507; SPGS = 3,793 and 3,373; SPGA = 3,220 and 2,932, respectively. The results indicate that all types of Brazilian glycerol used in this study are highly available energy source for starting pigs feeding.

*Financial support: CNPq (Brazil).*

**Key Words:** co-product, digestibility, glycerine

**W456 Prediction of carcass composition in crossbred pigs using the real-time ultrasound: Comparison of the interpreting results.** L. L. Lo\*, M. E. Tai, and C. C. Tsai, *Chinese Culture University, Taipei, III Taiwan, ROC*.

Efficient use of the real-time ultrasound to predict carcass composition is important. The objective of the study was to compare the interpreting results of the ultrasound images from the farm and laboratory when predicting backfat thickness and longissimus muscle area of the pigs. Ultrasound images were obtained from 147 three breed (Duroc, Yorkshire, and Landrace) terminal crossbred pigs (71 gilts and 76 barrows) using an Aloka SSD 500 real-time ultrasound. All pigs were raised under commercial farm environment, and slaughter at an average age of 205 days for an average weight of 117 kg. The day prior to slaughter, two transverse images at the tenth rib and the last rib were taken and interpreted from each pig, and the images also were taped to be interpret in the laboratory by a trained operator later on. Carcass backfat thickness and longissimus muscle area at the tenth and the last rib were measured at a commercial slaughter plant using the standard procedure. All data were analyzed using a linear model that included fixed effects of year, herd, sex, and method. Phenotypic correlations between ultrasonic and carcass measured backfat thickness at the tenth and the last rib ranged from 0.828 to 0.849 when interpreting the ultrasound data in the field, and ranged from 0.797 to 0.836 when interpreting that in the laboratory. Ultrasound and carcass measured longissimus muscle area were slightly lower correlated when interpreting the results in the laboratory ( $r = 0.646-0.719$ ) with that in the field ( $r = 0.722-0.755$ ). There were no significant differences between the two methods for backfat thickness and longissimus muscle area ( $P > 0.10$ ). When including ultrasound backfat thickness and longissimus muscle area in the regression equation for predicting carcass lean, interpreting results from the farm and laboratory gave the similar accuracies. Therefore, obtaining the real-time ultrasound images from the farm and interpret in the laboratory can be an optimal way in application of the real-time ultrasound technology for swine.

**Key Words:** interpreter, real-time ultrasound, carcass composition

**W457 The effect of type of housing during gestation on gilt farrowing and piglet performance.** R. Muns\*, J. L. Ruiz de la Torre, E. G. Manzanilla, X. Manteca, and J. Gasa, *SNiBA, Departament Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Barcelona, Spain*.

The objective was to evaluate the impact of gestation housing on gilt farrowing and piglet performance. Fifty-three gilts from a commercial farm were randomly distributed to one of the following treatments: T1) pen-grouped gestation (10 gilts/pen with an automatic feeding system) or T2) stall-allocated gestation. Back fat (BF) was measured ultrasonically

4 days before and 20 days after farrowing. Farrowing was monitored and the interval from 1st to last piglet born recorded. Piglets were weighted on farrowing day (day 0), day 1, day 2 and day 20 of lactation and rectal temperature (RT) was measured at birth. On day 2, litters were fixed at 12 piglets. Mortality before and after day 2 were registered. Data was analyzed with a one-way ANOVA with type of housing as main effect using SAS program. T1 sows had more BF at the beginning ( $18.7$  vs.  $14.6\text{mm} \pm 3.42$ ;  $P < 0.001$ ) and at the end of lactation ( $15.0$  vs.  $12.9\text{mm} \pm 4.86$ ;  $P < 0.003$ ) together with a shorter farrowing duration ( $2.5$  vs.  $3.0\text{h} \pm 0.93$ ;  $P = 0.077$ ). Piglets initial BW did not differ between groups (mean value of  $1.29 \pm 0.310\text{kg}$ ;  $P = 0.485$ ). T2 piglets had more RT at birth than T1 ( $38.7$  vs.  $37.5^\circ\text{C} \pm 1.34$ ;  $P < 0.001$ ) and had an increased BW gain on day 1 ( $58.7$  vs.  $41.6\text{g} \pm 67.68$ ;  $P = 0.059$ ). T2 gilts weaned more piglets ( $11.73$  vs.  $11.37 \pm 0.673$ ;  $P = 0.020$ ) with less piglet mortality from day 2 to 20 ( $0.21$  vs.  $0.56$  piglet/litter  $\pm 0.528$ ;  $P = 0.114$ ). Although T2 gilts had a 30 min. longer farrowing, their piglets were born with higher RT. This fact could help piglets to had a better colostrum intake resulting in higher energy and immunological status which may explain the enhanced surviving at weaning. According to our results, we conclude that for gilts, the transition from a pen-housing gestation to a stall-farrowing allocation may suppose a bigger stress compared to a transition from stall-housing gestation. That stress could have a negative repercussion on offspring body temperature at birth, compromising its colostrum intake.

**Key Words:** gilts, gestation housing, piglets

**W458 Performance of starting pigs fed on crude glycerol in Brazil.** I. Moreira<sup>1</sup>, P. L. de Oliveira Carvalho<sup>1</sup>, L. M. Piano<sup>1</sup>, J. B. Toledo<sup>1</sup>, A. G. Gallego<sup>2</sup>, and G. Moresco<sup>1</sup>, <sup>1</sup>Universidade Estadual de Maringá, Maringá, Paraná, Brazil, <sup>2</sup>Universidad Del Tolima, Ibagué, Tolima, Colombia.

This experiment was carried out to investigate the utilization of two types of crude glycerol which were obtained from soybean oil (CGS), and animal fat + soybean oil (CGA) on starting pigs performance. Glycerol is the main co-products of biodiesel production (esterification technologies using vegetable oil or animal fat). In Brazil, the primary feedstock for glycerol production is soybean oil. Chemical composition (as-fed basis): CGS (DM = 97.46%; CP = 0.06%; GE = 5,247 kcal/kg and ash = 4.45%) and CGA (DM = 94.55%; CP = 0.05%; GE = 5,242 kcal/kg and ash = 4.26%). In the performance trial, 90 piglets (BW =  $15.18 \pm 0.67$  to  $30.28 \pm 1.68$  kg) were allotted in a completely randomized design in  $2 \times 4$  factorial scheme, with different levels (3, 6, 9, and 12%) of two types of crude glycerol (CGS and CGA) in the diet. An additional control diet was formulated containing no glycerol (0%). Five pens with two pigs/pen for each treatment resulting in 10 observations per treatment. Experimental diets were formulated according to NRC (1998) as isoprotein and isoenergetic. Performance data of 0, 3, 6, 9, and 12% of CGS were, respectively: ADFI = 1.601, 1.650, 1.602, 1.532, and 1.572 kg; DWG = 0.889, 0.937, 0.901, 0.851, and 0.850 kg; F: G ratio: 1.81, 1.75, 1.78, 1.80, and 1.854, and, in the same way, performance data of CGA were, respectively: DFI = 1.601, 1.599, 1.645, 1.546, and 1.646 kg; DWG = 0.889, 0.851, 0.934, 0.855, and 0.929 kg; F: G ratio: 1.81, 1.88, 1.76, 1.82, and 1.77. There were no interaction among levels of CG and types of crude glycerol, and the regression analysis indicates no effects ( $P \geq 0.05$ ) of crude glycerol inclusion on piglet performance (DFI, DWG and F: G ratio). The results suggest that it is feasible to use up to 12% of both sources of CG on starting piglet diet, without impairing performance.

*Financial support: CNPq (Brazil).*

**Key Words:** biodiesel, co-product, glycerine

**W459 Fatty acid profile in different tissues of newborn piglets.** M. Sini, M. G. Manca, A. Nudda, and G. Battacone\*, *Dipartimento di Scienze Zootecniche, University of Sassari, Sassari, Italy.*

Objective of the present study was to investigate fatty acid deposition in different tissues of newborn piglets and its relationship with fatty acid composition of diet of gestating sows. Six Landrace  $\times$  Large White sows in second or third parity were bred with semen from a Landrace boar. During gestation, sows were individually housed in crates and fed a concentrate for gestating sows and gilts administered according to feed requirements during periods of fetal development. Immediately after parturition, one piglet per litter was stunned, exsanguinated and dissected. Brain, liver, hearth, thigh muscle of piglets and sows were weighed and samples were taken for fatty acid profile. Content of each fatty acid in organs and feed was expressed as a percentage of total FAME. Data were analyzed with one-way ANOVA using tissue as the main effect. The fatty acid profile was significantly different between tissues. Particularly, the highest content of PUFA n-3 was observed in brain ( $8.68$  g/100 g of FAME). This result is probably due to the higher concentration of DHA ( $8.49$  g/100 g of FAME) that actually represents 97% of total n-3 FA in the brain. The content of DHA is high also in liver where it represents about 85% of total n-3 fatty acid. The content of PUFA n-6 was higher in hearth ( $29.16$  g/100 g of FAME) than other tissues, maybe due to the higher content of linoleic and arachidonic acid ( $13.13$  and  $15.24$  g/100 g of FAME, respectively). High values of arachidonic acid were also observed in brain where it is about 93% of total n-6 fatty acid. The concentration of unsaturated fatty acid was higher in hearth where they account for 2/3 of total fatty acid, while saturated fatty acid were higher in brain and muscle ( $48.41$  and  $47.54$  g/100g of FAME, respectively). The research highlighted differences in long chain fatty acid composition between tissues of newborn piglets, especially for FA synthesized ex-novo.

**Key Words:** fatty acid, piglets, tissues

**W460 Effect of terminal sire genotype and gender on growth performance and carcass traits of European-Chinese pigs.** J. Viguera<sup>1</sup>, M. Sánchez\*<sup>1</sup>, S. Garrido<sup>1</sup>, J. Peinado<sup>1</sup>, F. Flamarique<sup>2</sup>, and L. Alfonso<sup>3</sup>, <sup>1</sup>Imasde Agroalimentaria S.L., Madrid, Spain, <sup>2</sup>Grupo AN, Navarra, Spain, <sup>3</sup>Universidad Pública de Navarra, Navarra, Spain.

A total of 168 pigs (half castrated male and half female) of  $25.4 \pm 4.1$  kg of initial BW from Youna crossbreds sows (Gene +, France) was used to evaluate the effect of two terminal sire genotypes (MUS vs. PIE) on performance and carcass traits. There were fourteen replicates of six pigs per treatment. Data were analyzed as a completely randomized design by GLM of SAS. The model included the terminal sire genotype and sex as main effects. All pigs were reared under similar environmental and nutritional conditions, and were slaughtered at  $102.3 \pm 8.65$  kg BW. MUS pigs grew faster than PIE pigs ( $782$  vs.  $711$  g/d;  $P < 0.01$ ). No significant differences in feed intake were detected. Therefore, MUS pigs showed lower feed conversion than PIE pigs ( $2.81$  vs.  $3.07$  g feed/g gain;  $P < 0.01$ ). MUS pigs showed longer carcasses and hams than PIE pigs ( $80.9$  vs.  $78.7$  cm and  $50.6$  vs.  $49.5$  cm, respectively;  $P < 0.01$ ). However, PIE pigs showed higher shape factor ( $1.46$  vs.  $1.43$ ;  $P < 0.01$ ) and had greater carcass yield ( $77.8$  vs.  $77.1\%$ ;  $P = 0.04$ ), ham yield ( $27.8$  vs.  $27.1\%$ ;  $P < 0.01$ ), and loin yield ( $7.40$  vs.  $6.91\%$ ;  $P < 0.01$ ) than MUS pigs. Castrated males grew faster ( $777$  vs.  $716$  g/d;  $P = 0.02$ ) and ate more feed ( $2.30$  vs.  $2.08$  kg/d;  $P < 0.01$ ) than females. Likewise, castrated males had more backfat and fat thickness at Gluteus medius muscle ( $21.2$  vs.  $18.1$  mm and  $17.3$  vs.  $13.4$  mm, respectively;  $P < 0.01$ ) but lower ham yield ( $27.0$  vs.  $27.8\%$ ;  $P < 0.01$ ) and loin yield ( $6.79$  vs.  $7.52\%$ ;  $P < 0.01$ ) than females. Results showed that Youna

crossbreds with MUS pigs perform better but have lower primal cut yields than Youna crossbreds with PIE pigs.

**Key Words:** European-Chinese pigs, growth performance, carcass traits

**W461 The effect of aeration on the slurry quality and microbial communities in liquid swine manure during the digestion.** M. Heo\*<sup>1,2</sup>, K. H. Park<sup>2</sup>, D. Y. Choi<sup>2</sup>, H. S. Kang<sup>2</sup>, and S. Oh<sup>1</sup>, <sup>1</sup>*Division of Animal Science, Chonnam National University, Gwangju, South Korea*, <sup>2</sup>*Animal Environment & Systems Division, National Institute of Animal Science R.D.A., Suwon, South Korea*.

Liquid swine manure can be converted to a liquid fertilizer by aeration. We examined the temporal changes in the microbial community and associated characteristics that occurred by aeration during the digestion. Liquid swine manure, collected from the swine barns of the National Institute of Animal Science (NIAS), was subjected to 2 treatments: one in which the manure was not aerated (the control sample) and the other in which the manure was aerated continuously at a rate of  $3.0 \text{ m}^3 \cdot \text{h}^{-1} \cdot \text{t}^{-1}$  (the aerated sample). The study was conducted in an outdoor research field at NIAS for 20 weeks (May to September). In the aerated sample, the concentration of volatilized  $\text{NO}_3$  decreased from the 6th week, with a concomitant steep increase in the  $\text{NH}_4^+$ -N and  $\text{NO}_3^-$ -N concentrations. The pH increased for the first 4 weeks and then decreased, and the decline was sharp in the 6th week. In the control sample, the concentration of volatilized  $\text{NH}_3$  continuously increased from the beginning, and the  $\text{NH}_4^+$ -N concentration slowly decreased. Nitrate was barely detected, and the pH was stable. There was a decrease in the number of bacteria, including Lactic acid bacteria, *Actinomyces*, coliformic bacteria, and *Salmonella*, and in the number of fungi; *Salmonella* could not be detected from the 18th week. *Bacillus* sp., *Acinetobacter* sp., *Pseudomonas* sp. (*Pseudomonas putida*), *Alcaligenes* sp., *Sphingobacterium* sp., *Brevundimonas diminuta*, and *Aeromonas hydrophila* were found in the aerated sample, but not in the control. In the aerated sample, *Bacillus* sp. were predominantly found in the 1st week; *Bacillus cereus* and *Bacillus pumilus*, in the 5th week; and *Bacillus cereus* and *Bacillus subtilis*, in the 6th week. This indicates that aeration promotes the growth of bacteria that are effective in reducing ammonia, and that *Bacillus* sp. are the most effective. Further research on the optimal cultivation conditions for the identified bacteria species would help in increasing the application of liquid fertilizers prepared from liquid swine manure.

**Key Words:** slurry, swine manure, microbial community

**W462 Growth performance of pigs finished on brewers-grade rice.** O. J. Gekara\* and T. V. Dunbar, *University of Arkansas at Pine Bluff, Pine Bluff*.

The objective of this study was to determine whether brewers-grade rice can replace corn or milo in finishing pig diets without compromising animal performance. Seventeen finishing pigs of Yorkshire  $\times$  Duroc breeding were randomly assigned to either brewers-grade rice/soybean meal mixture (RSB) or corn/milo based control (CON). The pigs were 157 days old at the start of the experiment and weighed  $87.9 \pm 3.4$  kg. The experiment lasted 28 days and finished pigs weighed  $119.0 \pm 3.2$  kg. Variables determined included ADG, ADFI, F:G ratio, apparent DM digestibility, and back fat thickness. There was no ( $P > 0.10$ ) treatment  $\times$  sex interaction for all variables measured. Compared to CON pigs, RSB pigs gained faster ( $1.26$  vs.  $0.95$  kg/d), had better F:G ratio ( $0.38$  vs.  $0.29$ ), higher apparent DM digestibility ( $91.0$  vs.  $74.0\%$ ), and lower ( $P < 0.001$ ) cost of gain ( $0.98$  vs.  $1.62$  \$/kg gain). Back fat thickness for the two layers, 1 and 2, was similar ( $P > 0.10$ ) for both groups ( $11.6$  vs.

$22.7$  mm, respectively). Results of this study suggest that brewers-grade rice can be a suitable alternative to corn or milo for finishing pigs with no adverse effects animal performance. In conclusion, hog producers in the Mississippi Delta (southeast Arkansas) where rice is abundant and relatively cheaper than corn or milo may derive substantial savings on feed costs with the use of brewers-grade rice as an energy source. However, more research is needed to determine the effect of growth performance on grade and carcass quality.

**Key Words:** brewers-grade rice, finishing pigs, pig performance

**W463 Differential expression of porcine sperm microRNAs and their association with sperm morphology and motility.** E. Curry\*<sup>1</sup>, T. J. Safranski<sup>2</sup>, and S. L. Pratt<sup>1</sup>, <sup>1</sup>*Clemson University, Clemson, SC*, <sup>2</sup>*University of Missouri, Columbia*.

Although miRNAs have been shown to alter translation in nearly every biological process examined to date, little is known as to the identity of miRNA in porcine gametes or their potential involvement in reproductive processes. Recent investigations have demonstrated that the miRNA synthesis pathway is necessary for differentiation of mature sperm in mice; however, the specific miRNAs responsible for spermatogenesis have not been identified. The objective of this study was to determine the identities and compare the expression levels of miRNAs in control porcine sperm samples which exhibited  $>75\%$  motility and  $<15\%$  poor morphology (C;  $n = 7$ ), samples with  $>15\%$  abnormal morphology (AB;  $n = 7$ ), and samples exhibiting  $<68\%$  motility (LM;  $n = 8$ ). qRT-PCR was performed in quadruplicate on 10 ng sperm RNA using the mirVana qRT-PCR miRNA Detection Kit (Ambion, Austin, TX) to compare expression levels of 10 specific miRNAs that are predicted to target genes that code for proteins involved in spermatogenesis, sperm structure, motility, or metabolism. Statistical analysis was performed using REST-2005 software with significance at  $P < 0.05$ . Results showed increases in the expression of four miRNAs, let-7a, -7d, -7e, and miR-22, in the AB group while miR-15b was decreased compared to C ( $P < 0.05$ ). Two miRNAs, let-7d and let-7e, were increased in the LM group when compared to C ( $P < 0.05$ ). Although the precise role of miRNA in sperm remains to be determined, their presence alone denotes an essential biological function. It is feasible that they are remnants of spermatogenic processes, stored for a later role in fertilization, or are delivered to the oocyte to influence early embryonic development. While there is no single cause of male infertility, the identification of miRNAs associated with sperm motility, structural integrity, or metabolism could lead to the development of a microarray or real time-based diagnostic assay to provide an assessment of male fertility status.

**Key Words:** microRNA, sperm, porcine

**W464 Prediction of carcass composition in crossbred pigs using the real-time ultrasound: Choices of probing and measuring sites.** L. L. Lo\*<sup>1</sup>, C. C. Tsai<sup>1</sup>, M. E. Tai<sup>1</sup>, R. S. Lin<sup>2</sup>, and T. H. Huang<sup>3</sup>, <sup>1</sup>*Chinese Culture University, 55 Hwa-Kang Road, Taipei, Taiwan, ROC*, <sup>2</sup>*National ILan University, ILan, Taiwan, 260 ROC*, <sup>3</sup>*Taiwan Farm Industry Co., Ltd., Pingtung, 900 Taiwan, ROC*.

Development of an optimum method for predicting carcass composition is essential for improving pig carcass performance. Real-time ultrasound data of backfat thickness, and longissimus muscle area were obtained from 147 three breed (Duroc, Yorkshire, and Landrace) terminal crossbred pigs (71 gilts and 76 barrows) using an Aloka SSD 500 real-time ultrasound machine to find the optimum probing and measuring sites between ultrasound measurements at the tenth and the last ribs for predicting carcass composition. All pigs were raised under



the commercial farm environment, and slaughter at an average age of 205 days for an average weight of 117 kg. The day prior to slaughter, two transverse images were taken at the tenth rib and the last rib from each pig. The backfat at two points, 1/2 and 3/4 the lateral length of the loin muscle perpendicular to the skin surface were measured. The correlation between ultrasonic and carcass measured fat thickness at the last rib were similar to those of the tenth rib at 1/2 and 3/4 point locations ( $r = 0.828-0.859$ ). Ultrasonic and carcass measured longissimus muscle area was slightly higher correlated at the 10th rib compared with that of last rib. The best correlations between carcass lean percentage and ultrasound measurements were obtained with 3/4 point fat thickness at the tenth rib ( $r = -0.45$ ) and with longissimus muscle area at the last rib ( $r = 0.47$ ). When predicting carcass lean yield, the regression equation included the tenth rib ultrasound backfat measured at 3/4 point location and the tenth rib longissimus muscle area, gave the highest accuracy ( $R^2 = 0.892$ ). Results from this study indicated that the tenth rib site and 3/4 point of the lateral length of the loin muscle can serve as the probing and measuring sites for prediction of carcass lean yield.

**Key Words:** ultrasound, carcass composition, pig

**W465 Association between lactation feed intake and wean to service interval of sows.** L. Anil<sup>1</sup>\*, S. S. Anil<sup>2</sup>, and S. K. Baidoo<sup>1</sup>, <sup>1</sup>*South-ern Research and Outreach Center, University of Minnesota, Waseca,* <sup>2</sup>*Veterinary Population Medicine, University of Minnesota, St Paul.*

Previous studies have indicated the effect of inadequate lactation feed intake on subsequent reproductive performance of sows in breeding herds. However, most of them have used average feed consumption during the entire lactation, ignoring the effect of stage of lactation. The number of days of inadequate feed intake could be a better indicator of inadequate lactation feed intake. Factors such as parity, body condition of the sow at the end of gestation and litter size influence the quantity of feed consumed during lactation. The objective of the present study was to determine the association of number of days of <3 kg of feed consumption during the first 14 days of lactation with wean to service interval (WSI), accounting for the effects of parity and body condition of the sow prior to farrowing. This study involved 504 sows (289 sows housed in pens with electronic sow feeders and 215 sows in gestation stalls). Data with 990 parities of these sows with one or two farrowings, collected from the PigCHAMP database of the research unit were used for the analysis (Poisson regression, Proc genmod, SAS v 9.1). The average lactation feed intake and average WSI in the database were 6.0 kg and 7 days respectively. The number of days of 0 kg feed consumption increased by 4% ( $P < 0.05$ ) with every day increase in WSI suggesting the negative relationship between daily lactation feed intake and WSI. The number of days of <0.5, <1.0, <1.5, <2.0, <2.5 and <3.0 kg of feed consumption within the first 14 days of lactation increased by 4.0, 3.1, 1.7, 1.9, 1.6 and 0.8% respectively ( $P < 0.05$  all) for every day increase in WSI. This study confirms the negative relationship between lactation feed intake and WSI and indicates the need to ensure adequate lactation feed intake on all days during early lactation to prevent prolongation of wean to service interval.

**Key Words:** lactation feed intake, wean-to- service interval, sows

**W466 Effect of terminal sire genotype and gender on growth performance and carcass traits of European-Chinese pigs destined to the dry-cured industry.** M. Sánchez<sup>1</sup>\*, J. Viguera<sup>1</sup>, C. Carrasco<sup>1</sup>, J. Peinado<sup>1</sup>, F. Flamarique<sup>2</sup>, and L. Alfonso<sup>3</sup>, <sup>1</sup>*Imasde Agroalimentaria S.L., Madrid, Spain,* <sup>2</sup>*Grupo AN, Navarra, Spain,* <sup>3</sup>*Universidad Pública de Navarra, Navarra, Spain.*

A total of 160 pigs (half castrated male and half female) of  $23.7 \pm 5.0$  kg of initial BW from Youna crossbreeds sows (Gene+, France) was used to evaluate the effect of Duroc boar terminal sire (T line, fatter vs. P line, leaner) on performance and carcass and meat quality traits. There were eight replicates of ten pigs per treatment. All pigs received a common diet based on cereals and soybean meal ad libitum, and were slaughtered at the same age (177 d of age) with  $116.5 \pm 10.4$  kg of final BW. Data were analyzed as a completely randomized design by GLM of SAS. The model included the boar terminal sire and sex as main effects. The slaughter weight was used as a covariate for carcass quality traits. Pigs from P sire line had lower feed conversion (2.85 vs. 2.98 g feed/g gain;  $P < 0.05$ ) than pigs from T sire line. Ham yield tended to be higher in the P line pigs (26.73 vs. 26.46%;  $P = 0.07$ ). However, no significant differences between P and T sire line pigs were found for backfat. Also, loins from T line pigs had higher redness value than those from P line pigs (4.16 vs. 3.52;  $P = 0.04$ ), but no significant differences were observed between genotypes for lightness and yellowness of loin. Castrated males ate more feed (2.63 vs. 2.36 kg/d;  $P < 0.01$ ), showed higher feed conversion (3.05 vs. 2.78 g feed/g gain;  $P < 0.01$ ) and fatter carcasses (21.3 vs. 18.7 mm;  $P < 0.01$ ) than females. Besides, females had higher carcass yield (76.19 vs. 75.35%;  $P < 0.01$ ), ham yield (26.82 vs. 26.36%;  $P < 0.01$ ), and loin yield than castrated males (7.98 vs. 7.99%;  $P < 0.01$ ). It is concluded that Youna crossbreeds with P sire line pigs perform better than T sire line pigs. However, no major differences were found between the male sire lines on carcass and meat quality traits of European-Chinese pigs destined to dry-cured product industry.

**Key Words:** European-Chinese pigs, pig performance, carcass quality

**W467 Effect of hyperprolific Chinese sow genetic on sow performance.** J. Viguera<sup>1</sup>, M. Sánchez<sup>1</sup>\*, J. Sánchez<sup>1</sup>, P. Medel<sup>1</sup>, F. Flamarique<sup>2</sup>, and L. Alfonso<sup>3</sup>, <sup>1</sup>*Imasde Agroalimentaria S.L., Madrid, Spain,* <sup>2</sup>*Grupo AN, Navarra, Spain,* <sup>3</sup>*Universidad Pública de Navarra, Navarra, Spain.*

A total of 58 primiparous sows was used to evaluate the effect of two hyperprolific Chinese genetics (Taizumu vs. Youli) on sow performance. All sows received ad libitum a common liquid diet from mating until weaning of piglets. Observations included body weight and fat depth at P2 at mating and every 4 weeks until weaning, feed intake during lactation, number of piglets born alive and weaned per sow and weight of litter at birth after cross-fostering and at weaning. Data were analyzed as a completely randomized design by GLM of SAS. At farrowing, Youli sows were heavier than Taizumu sows (88.8 vs. 81.2 kg;  $P = 0.07$ ), a near significant trend. No other differences were detected on body weight or backfat during the experiment. Taizumu sows had a higher number of piglets born alive (13.84 vs. 10.87 piglets;  $P < 0.01$ ), but with smaller body weight (1.24 vs. 1.41 kg;  $P = 0.02$ ) and less uniformity (79.41 vs. 81.75%;  $P = 0.02$ ) than Youli sows. However, Youli sows weaned a higher number (10.35 vs. 9.62 piglets;  $P < 0.01$ ) of heavier piglets (7.22 vs. 6.71 kg;  $P = 0.01$ ) than Taizumu sows. Moreover, Youli sows ate more feed (289.6 vs. 272.2 g/d;  $P = 0.04$ ) than Taizumu sows during lactation. Under our experimental conditions it can be concluded that Youli sows had higher number of piglets born alive, but Taizumu sows weaned a higher number of heavier piglets.

**Key Words:** hyperprolific Chinese sows, piglet performance

**W468 Influence of crowding stress during the nursery period on growth performance of gilts and barrows.** J. H. Cho<sup>\*</sup>, H. J. Mon-

egue, M. D. Lindemann, and G. L. Cromwell, *University of Kentucky, Lexington*.

Stocking density and/or floor space allowance can influence pig performance and, consequently, profitability. The objective of this study was to determine the effects of stocking density and floor space allowance during the nursery period on growth performance of gilts compared to barrows. Gilts were then retained to examine continuing effects on growth with the intent of following them through reproduction. During a 6-wk crowding period, a total of 240 pigs (120 gilts and 120 barrows; mean age of 21 d;  $6.8 \pm 1.0$  kg BW) were allotted to 3 space allowances (SA) in a  $2 \times 3$  arrangement (sex [gilts vs barrows] and SA [SA1, 6 pigs in a full pen:  $1.22 \times 2.44$  m<sup>2</sup>, 0.50 m<sup>2</sup>/pig; SA2, 12 pigs in a full pen: 0.25 m<sup>2</sup>/pig; SA3, 6 pigs in a half pen:  $1.22 \times 1.22$  m<sup>2</sup>, 0.25 m<sup>2</sup>/pig]). Feeder space and water nipple availability was identical for each pig in all treatments; diets were nutritionally adequate (NRC, 1998). During the grow-finish period, gilts had adequate floor space (6 pigs in a pen; 0.93m<sup>2</sup>/pig). For the 6-wk nursery period, crowding reduced ADG ( $P < 0.01$ ) in gilts (577, 536, and 558 g/d for SA1, SA2, and SA3, respectively) and barrows (578, 539, and 527 g/d). While ADFI and F/G were not affected by stocking density or SA, there was a much larger change in ADFI among treatments (gilts: 907, 845, 884; barrows: 916, 891, 858 g/d) than there was in F/G. (gilts: 1.57, 1.58, 1.58; barrows: 1.58, 1.65, 1.63). There was no sex by SA interaction on performance measures. During the grow-finish period, when gilts were housed at the same density in pens with the same space, there were no differences ( $P > 0.10$ ) in ADG (890, 864, and 891 g/d), ADFI (2,677, 2,559, and 2,636 g/d), or F/G (3.01, 2.96, and 2.96) based on previous nursery housing treatment. These results demonstrated that crowding stress during the nursery period negatively affected growth performance of both gilts and barrows during that period of stress, but a continued effect of that stress was not manifested in gilts when subsequently housed in adequate space during the grow-finish period.

**Key Words:** nursery pigs, crowding stress

**W469 Feed intake of gilts following intracerebroventricular injection of the novel hypothalamic RFamide (RFa) neuropeptide, 26RFa.** C. J. Rogers<sup>\*1</sup>, N. L. Heidorn<sup>1</sup>, C. R. Barb<sup>2</sup>, G. J. Hausman<sup>2</sup>, M. J. Azain<sup>1</sup>, R. Rekaya<sup>1</sup>, and C. A. Lents<sup>1</sup>, <sup>1</sup>*University of Georgia, Athens*, <sup>2</sup>*USDA-ARS Richard B. Russell Agriculture Research Center, Athens, GA*.

RFamide (RFa) peptides have been implicated in a broad spectrum of biological processes including energy expenditure and feed intake. 26RFa is a recently discovered hypothalamic neuropeptide that altered the release of pituitary hormones and stimulated feed intake via a NPY-specific mechanism in rats. Voluntary food intake in the pig is regulated by changes in NPY, and we speculate that 26RFa is involved in the process. Thus, we tested the hypothesis that 26RFa stimulates food intake in the domestic pig. Prepuberal gilts ( $73 \pm 17$  kg BW) were fitted with intracerebroventricular (i.c.v.) cannulas and housed in individual pens. Pigs were allowed ad libitum access to feed for 7 d prior to treatment to establish a base line for voluntary feed intake. On the day of the experiment, feeders were removed from all pens at 0900 h. Beginning at 1100 h, gilts received i.c.v. injection of either 10 (n = 8), 50 (n = 7) or 100 µg (n = 7) of 26RFa in 0.9% saline. Control animals received either 100 µg of NPY (n = 5) or 0.9% saline alone (saline; n

= 5). Feeders were placed in all pens immediately after the last i.c.v. injection (1200 h) and cumulative intake was determined at 4, 8 and 24 h. Treatment had no effect on feed intake at 4 h. Feed intake of saline treated gilts at 8 h was not different when compared with 26RFa treated animals. However, NPY treated pigs ate more at 8 h ( $1.64 \pm 0.20$  kg) than saline treated pigs ( $1.07 \pm 0.20$  kg;  $P < 0.05$ ) or pig receiving either 10 µg ( $0.90 \pm 0.16$  kg;  $P < 0.01$ ) or 50 µg ( $1.13 \pm 0.16$  kg;  $P < 0.06$ ) of 26RFa. Feed intake at 8 h of pigs treated with 100 µg ( $1.27 \pm 0.17$  kg) of 26RFa was not different from either NPY or saline treated animals. There were no differences between treatments in feed intake at 24 h. We conclude that 26RFa is not an orexigenic neuropeptide in the pig. Further study is needed to determine the effects of i.c.v. injection of 26RFa on hormone release from the anterior pituitary gland of the gilt.

**Key Words:** feed intake, 26RFa, hypothalamus

**W470 Increasing productivity and disease control on swine farms through management tools: A field study.** G. Rocha-Chavez<sup>\*1</sup>, J. Castañeda<sup>2</sup>, A. Sepulveda<sup>1</sup>, J. G. Michel-Parra<sup>1</sup>, M. A. Pinto<sup>2</sup>, O. Montañez<sup>1</sup>, A. Martínez<sup>1</sup>, and J. M. Tapia-Gonzalez<sup>1</sup>, <sup>1</sup>*Universidad de Guadalajara, Cd Guzman, Jalisco, Mexico*, <sup>2</sup>*Private Practice, Tamazula, Jalisco, Mexico*.

Current swine production systems use genetic and other technological tools to increase effectivity and profitability, however, emergent and old diseases are always devastating potential capacity of swine business. The present paper discuss a field study that combine a series of management tools that increased competitiveness in a porcine farm. Although this model has been implemented in different swine production systems, we describe the field experience of a small farm located at the southern part of Jalisco state in Mexico. A Farrow-to-finish 200-sow farm was selected for the present study. The farm was PRRS and PCV positive with glasser disease and mycoplasma persistent outbreaks. A very low feed efficiency and kg/sold/sow/year was present at the farm before intervention as well as high production costs (see table for more parameters). The following tools were implemented for 2 years: (1) Closed herd: the genetic progress was achieved by means of artificial insemination with no live animal introduction whatsoever. (2) Close monitoring of reproduction management: Heat detection and insemination was priority number one on morning chores. (3) Autovaccination program: A professional and well controlled autogenous vaccination program was implemented using exclusively row material from the farm. (4) Employers management program: an incentive-based program was implemented on the premise of happy workers are efficient partners.

**Table 1.** Production parameters at a pig farm before or after implementing selected management tools

Production parameter	Before	After
Wean to finish mortality, %	7.3 <sup>a</sup>	1.9 <sup>b</sup>
Farrowing rate, %	78.3 <sup>a</sup>	87.7 <sup>b</sup>
Feed efficiency, (feed to gain ratio)	3.7 <sup>a</sup>	2.8 <sup>b</sup>
Veterinary Services/Medicine per Cwt, US\$	9.27	6.32
Total Cost per Cwt of Pork Produced, \$	164.00 <sup>a</sup>	117.00 <sup>b</sup>

Different letters in the same line are statistically different,  $P < 0.05$ .

**Key Words:** swine, profitability, management tools