

cell counts (QSCC). The teat structures were examined using the ultrasound machine model ALOKA SSD 500 with 5 MHz linear probe. The teat structures consist of teat-canal length (TCL), teat-width (TW) at the top of the teat canal, teat-wall thickness (TWT) at 1 cm above the end of the teat canal and teat-cistern width (TCW) at the same level. On each teat, all structures were scanned before and after the evening milking period. Data on the averages of bulk milk somatic cell counts (BSCC) for the month of experiment were collected from their farm's cooperatives. Farms with BSCC more than 300,000 cells/ml were defined as high BSCC (HBSCC). Student's T Tests were used to

compare the changing of teat structures after milking and log of QSCC between quarters from farms with high and low BSCC. Results show that average BSCC of farms with high and low BSCC was  $372 \pm 25.5$  ( $n=5$ ) and  $197 \pm 41.6$  ( $n=5$ ) x1,000 cells/ml, respectively. The QSCC and percent changes in TWT and TCW were different between farms with high and low BSCC ( $P < 0.05$ ). Percentage of changes in TWT and TCW of HBSCC farms (9.75% and -18.42%, respectively) were significantly different from farms with low BSCC (2.42% and -8.38%, respectively). In conclusion, the changes in teat structures after milking are associated with BSCC.

**Key Words:** Teat, Somatic Cell, Milking

## Production, Management & the Environment - Livestock and Poultry: Livestock Production and Management

**760 Effects of winter feeding systems on cow performance, soil nutrients, and crop biomass.** B. M. Kelln\*<sup>1</sup>, H. A. Lardner<sup>1,2</sup>, J. Schoenau<sup>1</sup>, and K. Lang<sup>1</sup>, <sup>1</sup>University of Saskatchewan, Saskatoon, Saskatchewan, Canada, <sup>2</sup>Western Beef Development Centre, Lanigan, Saskatchewan, Canada.

Two experiments were conducted to determine the effects of winter feeding systems on beef cow performance, soil nitrogen (N), and crop yield (DMY) the following year. The research site was a 40 hectare field seeded to barley (*Hordeum vulgare*) (cv. Ranger), located on Orthic Black soil. At the site, experiment one consisted of 36 hectares that was used for a winter feeding trial, while experiment two consisted of a 4 hectare paddock that was used for compost vs. fresh manure trial. In experiment one, crossbred pregnant beef cows ( $n=180$ ) (range 626 to 634 kg) were allocated to one of four replicate ( $n=3$ ) winter feeding systems. Feeding systems included (1) field bale grazing (BG), round barley greenfeed bales fed *ad libitum*; (2) field straw & chaff grazing (ST/CH), barley straw/chaff piles fed *ad libitum*; (3) field swath grazing (SG), barley swaths fed in windrows *ad libitum*; and (4) drylot feeding (DL), round barley greenfeed bales fed *ad libitum* in bunk. Cows were weighed at start, every 21 d and end of feed period. Ultrasound measurements (rib and rump fat) and body condition scores [5-point scale (1=thin, 5=fat)] were taken at the start and end of feed period. In experiment two, fresh (FM) and composted (CM) manure from the DL system was applied mechanically in the fall on replicated plot areas ( $n=4$ ). Spring soil samples were taken from high, mid, and low slope positions ( $n=3$ ), at the 15 cm soil levels for both experiments. DMY was estimated for both experiments by sampling ( $n=5$ ) using meter quadrats. In experiment one, manure distribution of each treatment was mapped using a 32 point grid and computer analysis programming. Cow body weight ( $P<0.01$ ), was minimally affected by the swath graze treatment. Soil N levels were not significantly different ( $P>0.10$ ) between slope positions or treatments. Results indicate that extensive winter feeding systems on annual cropped fields have minimal effects on cow performance, DMY and soil N levels.

**Key Words:** Dry Matter Yield, Straw/Chaff Grazing, Swath Grazing

**761 Incorporating condensed corn distillers solubles into an integrated pasture and drylot finishing system for feedlot steers.** T. Purevjav\*, M. P. Hoffman, and W. B. Roush, Iowa State University, Ames.

The objectives of this experiment were to evaluate the use of condensed corn distillers solubles (CCDS) mixed with chopped corn stalks on a pasture and drylot growing-finishing program. A three-year study was conducted, using 112 Angus and Angus crossbred steer calves each year. Calves were weighed and assigned to four treatment groups by weight and color pattern, with 4 replications, and 7 cattle per replication in each year respectively. Treatments one (TRT 1) and two (TRT 2) were fed in the feedlot from May until harvested. TRT 1 included chopped alfalfa hay and corn, and TRT 2 included chopped corn stalks and CCDS. Treatments three (TRT 3) and four (TRT 4) utilized rotational bromegrass pasture grazing (May-September) with TRT 4 also receiving chopped corn stalks and CCDS. Following pasture, chopped alfalfa hay and corn (TRT 3) or chopped corn stalks and CCDS (TRT 4) were provided during the feedlot finishing period. Steers were weighed every 28 days and daily feed intake was recorded to obtain feed consumption and feed conversion among the treatments during drylot feeding. The bromegrass pasture consisted of 24 paddocks, each .69 ha in size. Cattle were fed on average to 591 kg and harvested to obtain carcass measurements. Comparing TRT 1 vs. TRT 2 and TRT 3 vs. TRT 4, TRT 1 and TRT 3 had greater daily DMI and ADG ( $P<0.05$ ) than TRT 2 and TRT 4, respectively. Feed conversion during the drylot feeding period favored TRT 1 over TRT 2 and TRT 3 over TRT 4 ( $P<0.05$ ), and overall TRT 1 and 2 over TRT 3 and 4 ( $P<0.05$ ). When TRT 3 and TRT 4 were removed from pasture, TRT 4 had gained well over .23 kg/day better than TRT 3. Though this advantage did not carry over into drylot feeding, this might be a function of daily energy intake while on pasture. Average carcass weights and liver abscesses were not significantly different across treatments, but differences were found among treatments ( $P<0.05$ ) for loin eye area, backfat thickness and kidney, pelvic and heart fat. The finding resulted in a slightly higher quality grade for cattle fed in the feedlot and on hay for the duration of the feeding period. Overall treatment responses for yield and quality grades were similar.

**Key Words:** Feedlot Cattle, Pasture, Condensed Corn Distiller Solubles

**762 Effects of pre-breeding target weight and progesterin on reproduction, calving parameters, and rebreeding in beef heifers.** J. L. Martin\*, K. W. Creighton, J. A. Musgrave, D. C. Adams, and R. N. Funston, *University of Nebraska West Central Research and Extension Center, North Platte.*

Two experiments evaluated pre-breeding target weight or progesterin exposure for heifers developed lighter than traditional recommendations. Exp. 1 evaluated effects of system on heifer performance through subsequent calving and re-breeding over 3 yr. Heifers (229 kg) were assigned randomly to be developed to 55% mature BW (MBW; 299kg) before a 45-d breeding season (Intensive, INT; n = 119) or 50% MBW (272 kg) before a 60-d breeding season (Relaxed, RLX; n = 142). Pre-breeding and pregnancy diagnosis BW were greater ( $P < 0.001$ ) for INT than RLX. Overall pregnancy rate did not differ (88.5%;  $P = 0.51$ ), but RLX heifers had lower conception rate the first 30 d of the breeding season (67.9% vs. 81.8%;  $P = 0.03$ ), later calving dates (9 d;  $P < 0.001$ ), and lighter calf weaning BW (190 vs. 197 kg;  $P < 0.001$ ) compared to INT. Calf birth BW ( $P = 0.61$ ), calving difficulty ( $P = 0.30$ ), weaning rate ( $P = 0.67$ ), second-calf conception rates ( $P = 0.70$ ), and 2-yr old retention rate (73.4%;  $P = 0.82$ ) did not differ between systems. Of heifers that failed to become pregnant, more ( $P = 0.07$ ) RLX than INT heifers were pre-pubertal when the breeding season began. Therefore, a second 2 yr experiment evaluated melengesterol acetate (MGA, 0.5 mg/d) as a means of hastening puberty in heifers developed to 50% MBW. Heifers were assigned randomly to receive CON (n = 103) or MGA (n = 81) for 14 d and placed with bulls 13 d later for 45 d. Pre-breeding and pregnancy diagnosis BW were similar (280 kg and 380 kg, respectively;  $P > 0.10$ ) for CON and MGA. Proportion of heifers pubertal prior to breeding (74%), pregnancy rate (90%), calving date, calf weaning BW, and second breeding season pregnancy rate (92%), were similar ( $P > 0.10$ ) between treatments. Developing heifers to 50 or 55% MBW resulted in similar overall pregnancy rates and supplementing heifers developed to 50% MBW with MGA prior to breeding did not improve reproductive performance.

**Key Words:** Heifer Development, Progesterin, Target Weight

**763 Simulation model of fat deposition and distribution in beef steers: 3. Model description and development.** M. J. McPhee\*<sup>1,2</sup>, J. W. Oltjen<sup>1</sup>, J. G. Fadel<sup>1</sup>, and R. D. Sainz<sup>1</sup>, <sup>1</sup>University of California, Davis, <sup>2</sup>NSW DPI, Armidale, Australia.

The 1<sup>st</sup> objective of this study was to describe the first-order differential equations of intermuscular (INTER), intramuscular (INTRA), subcutaneous (SUB), and visceral (VIS) fat (kg) depots in the Davis Growth Model of fat deposition and distribution. The 2<sup>nd</sup> objective, using acslXtreme (Huntsville, Alabama USA, Xcellon), was to (a) estimate the parameters for protein synthesis ( $\text{kg}^{0.27}$ ) and maintenance ( $\text{Mcal.kg}^{-0.75}.\text{day}^{-1}$ ) and (b) estimate parameters for the 4 fat depots (1/kg DNA). The data used are from a meta-analysis study of implanted and nonimplanted steers across a range of frame sizes. The 3<sup>rd</sup> objective was to test the hypothesis that different fat depots are metabolically different. Parameter estimates for protein synthesis ( $\text{kg}^{0.27}$ ) were  $0.0487 \pm 0.0001$  and  $0.0467 \pm 0.0001$  for implanted (n = 94) and nonimplanted (n = 44) steers, respectively and parameter estimates for maintenance ( $\text{Mcal.kg}^{-0.75}.\text{day}^{-1}$ ) were  $0.1133 \pm 0.0014$  and  $0.1035 \pm 0.0026$ , for implanted (n = 94) and nonimplanted (n = 42) steers, respectively. A 4.1% increase in the protein synthesis parameter was detected between implanted and nonimplanted steers. Fat depot

parameters (1/kg DNA) were estimated and no differences between implant status and frame size were detected. The mean (n = 129) of the 4 fat depot parameter coefficients were  $0.1596 \pm 0.0061$ ,  $0.3447 \pm 0.0049$ ,  $0.2715 \pm 0.0061$ , and  $0.2242 \pm 0.0063$  for INTER, INTRA, SUB, and VIS, respectively. This study suggests that fat depots are not metabolically different between frame sizes and implant status at the level of aggregation used to simulate fat deposition in beef steers. Therefore the mean of the 4 fat depot parameter coefficients would be used in the first-order differential equations in the Davis Growth Model.

**Key Words:** Fat Depots, First-order Differential, Parameter Estimation

**764 Simulation model of fat deposition and distribution in beef steers: 4. Model evaluation.** M. J. McPhee\*<sup>1,2</sup>, J. W. Oltjen<sup>1</sup>, J. G. Fadel<sup>1</sup>, and R. D. Sainz<sup>1</sup>, <sup>1</sup>University of California, Davis, <sup>2</sup>NSW DPI, Armidale, Australia.

The first-order differential equations for intermuscular (INTER), intramuscular (INTRA), subcutaneous (SUB), and visceral (VIS) fat depots (kg) in the Davis Growth Model of fat deposition and distribution in beef steers were evaluated. The models were challenged with an independent data set (ad libitum and limit fed finishing steers, frame size=5.6, no implants; n=107; BW=288 to 557 kg; ADG=0.55 to 2.45 kg/d; body fat=20 to 153 kg; backfat=0.51 to 17.78 mm; IMF=0.47 to 8.09 %; KPH=0.5 to 3.5 %) that looked at compensatory growth in steers that had been subjected to different forms of restriction in the growing phase. Carcass characteristics were converted to their respective kg of fat. Several techniques were used to evaluate the model: (a) mean bias (MB, observed – model-predicted); (b) modeling efficiency (MEF, values close to 1 indicate a perfect model and values < 0 indicate a very poor model); (c) Kolmogorov-Smirnov (KS) 2-sample test; and (d) linear regression. The KS was a test of the hypothesis that the observed and model-predictions have the same parent distribution. The linear regression evaluated slope=1, intercept=0 and bias using the simultaneous F-statistic for both slope=1 and intercept=0. The results were: MB of 1.95, -0.33, -0.07, and -1.15 kg; MEF of 0.75, 0.63, 0.64, and 0.56, for INTER, INTRA, SUB, and VIS, respectively; the KS test ( $P=0.01$ ) indicated that the observed and model-predicted values were from the same parent distribution for all fat depots and the linear regression indicated there was no bias  $P=0.19$ ,  $P=0.33$ , for INTRA and SUB, respectively and some bias  $P=0.02$ ,  $P<0.01$  for INTER and VIS, respectively. The results from this study show a reasonable degree of precision (MEF) although differences do exist between treatments. On the average (MB) the model over predicts for INTRA, SUB, and VIS however the model tends to under-predict fat as fat increases in the carcass. This under-prediction as fat increases in all 4 fat depots could possibly be due to a secondary phase of hyperplasia that is not currently represented. Additional data sets to challenge the model are required to confirm this phenomenon.

**Key Words:** Carcass Characteristics, Fat Depots, First-order Differential

**765 Use of neonatal blood parameters to predict weaning weight in Brahman cattle.** J. P. Banta\*<sup>1</sup>, N. C. Burdick<sup>1</sup>, J. C. White<sup>1</sup>, R. C. Vann<sup>2</sup>, D. A. Neuendorff<sup>1</sup>, A. W. Lewis<sup>1</sup>, J. C. Laurenz<sup>1</sup>, T.

H. Welsh, Jr.<sup>1</sup>, and R. D. Randel<sup>1</sup>, <sup>1</sup>Texas A&M University System, Overton, College Station, Kingsville, <sup>2</sup>Mississippi State University, Raymond.

An experiment was conducted to determine the utility of various blood parameters obtained approximately 24 h after birth to predict future performance of beef calves. Plasma and serum samples were collected from 111 calves and analyzed for plasma protein, serum protein, IgA, IgM, and IgG concentration. Calf BW were obtained at birth and weaning (average age = 172 d); weaning BW were adjusted to 172 d of age. Based on blood concentration of each parameter, calves were assigned to low, medium, and high groups. For example, calves with plasma protein concentrations less than 1 SD below the mean were assigned to the low group (n = 23), those with concentrations greater than 1 SD above the mean were assigned to the high group (n = 21), and all remaining calves were assigned to the medium group (n = 67). This procedure was repeated for serum protein (n = 22, 69, and 20; low, medium, high, respectively), IgA (n = 8, 92, and 11), IgM (n = 0, 96, and 15), and IgG (n = 22, 73, and 16). The statistical model included the blood parameter being tested, calf sex, calf temperament, and cow temperament. Of the five blood parameters only serum protein classification had a significant effect on calf weaning BW (Table 1). Correlation coefficients were determined for each blood parameter and weaning BW; plasma protein (r=0.11; P=0.26), serum protein (r=0.11; P=0.27), IgA (r=0.14; P=0.14), IgM (r=0.19; P=0.04), and IgG (r=0.13; P=0.17). The results of this experiment suggest that of the blood parameters evaluated, serum protein concentration may be the most appropriate measure for predicting future performance of suckling calves.

**Table 1. Effect of blood parameter classification on adjusted 172 d weaning BW, kg**

	Low	Medium	High	SE	P =
Plasma protein	163	173	173	5.5	0.13
Serum protein	162 <sup>x</sup>	171 <sup>y</sup>	180 <sup>z</sup>	5.6	0.03
IgA	174	169	178	7.8	0.32
IgM	-	170	174	6.2	0.46
IgG	167	170	176	5.7	0.48

<sup>x,y,z</sup>Within a row, means lacking a common superscript differ (P < 0.10).

**Key Words:** Serum Protein, Performance

**766 Effects of pre-shipment management on measures of performance and inflammation in beef calves entering a receiving feedlot.** J. D. Arthington<sup>\*1</sup>, X. Qiu<sup>1</sup>, R. F. Cooke<sup>1</sup>, D. B. Araujo<sup>1</sup>, C. C. Chase<sup>2</sup>, and S. W. Coleman<sup>2</sup>, <sup>1</sup>University of Florida-IFAS, Range Cattle Research and Education Center, Ona, <sup>2</sup>USDA-ARS, Brooksville, FL.

Our objectives were to evaluate the effects of pre-shipment management on performance of calves subjected to a 24-h transport. The study was conducted over two consecutive years using a total of 96 crossbred steers. Steers were randomly allocated to one of four pre-shipment management strategies: 1) Control; weaned immediately prior to transport, 2) Creep-fed; free-choice access to grain for 45 d prior to weaning, 3) Pre-weaned; weaned 45 d prior to shipping, and 4) Early-weaned; weaned at 80 d of age. On d 0, calves were loaded onto a commercial truck, hauled for 24 h, and delivered into a feedlot (d 1). Calves were penned within treatment (4 pens per treatment) and

provided free-choice access to hay and grain. Calf BW and blood samples were obtained on d 0, 1, 4, 8, 15, 22, 29 and 30. Concentrations of haptoglobin and ceruloplasmin were measured in blood samples. Overall calf ADG was greater for early-weaned vs. control calves. In wk 1, early-weaned calves consumed more grain and less hay compared to control calves and pre-weaned calves consumed more grain, but a similar amount of hay compared to creep-fed calves. Overall DMI intake was greatest for early-weaned compared to control, and pre-weaned compared to creep-fed calves. Feed efficiency of early-weaned calves was greater than control, but similar among pre-weaned and creep-fed calves. Haptoglobin concentrations were less in creep-fed vs. pre-weaned calves on d 0, but increased sharply after shipping and were greater than pre-weaned on d 1 and 4. In Yr. 1, control calves experienced a sharp increase in ceruloplasmin concentrations, resulting in concentrations greater than early-weaned on d 15, 22, and 29. Creep-fed calves also experienced greater ceruloplasmin concentrations than pre-weaned calves on d 29 (Yr. 1) and d 4 (Yr. 2). These data suggest that early-weaned calves (80 d of age) have improved performance in the receiving yard compared to calves weaned directly prior to transport and feedlot entry. Differences in pre-shipment management appear to significantly impact measures of the acute phase response in calves.

**Key Words:** Weaning, Calves, Stress

**767 Water solubility of phosphorus in feedlot cattle feces and manure.** V. R. Bremer<sup>\*</sup>, C. D. Buckner, G. E. Erickson, and T. J. Klopfenstein, University of Nebraska, Lincoln.

Runoff from manure is a concern with elevated concentrations of phosphorus (P) in surface waters. The water solubility of P can have a dramatic impact on the runoff potential of feedlot cattle feces and manure. Two hundred fifty-four fecal samples and 158 manure samples from 15 University of Nebraska feedlot nutrient mass balance studies were analyzed to evaluate the effect of level of P intake on water extractable P (WEP). Samples were from diets ranging from 0.10 to 0.49% P. Total P (TP) of each sample was analyzed in duplicate by ashing one g of sample at 600 degrees C for six hours, refluxing with 10 mL of 3 N HCl for 5 min., standardizing to 100 mL volume with double distilled water, and filtering through Whatmann 42 filter paper. Water extractable P was analyzed in duplicate by shaking 0.5 g DM of each sample with 100 mL double distilled water at 150 rpm for one h, a 50 mL aliquot was then centrifuged at 1500 g for 10 min, 125 µL of concentrated HCl was added to a subsequent 14 mL aliquot of supernate. All samples were stored at 4 degrees C prior to colorimetric analysis with the molybdovanadate method on a spectrophotometer (400 nm) calibrated with standards developed in a matrix similar to each analytical procedure. There was a linear increase (P < 0.01) in concentration of fecal TP as dietary P level increased. Changing from a 0.30% P diet to a 0.50% P diet increased fecal P concentration 67%. Fecal WEP (% of TP) did not change as fecal TP concentration increased (P = 0.55) and averaged 40% WEP. Dietary P concentration was not related to manure WEP (P = 0.43) and averaged 23% WEP. Manure WEP increased as manure TP concentration increased (P < 0.01) but not disproportionately. Changing manure TP from 0.25% to 0.50% increased manure WEP 38%, although, there is considerable trial to trial variation. These data suggest that pen surface conditions impact the water solubility of P in feedlot cattle manure. One factor influencing P solubility is OM content of manure from open lots.

**Key Words:** Feedlot Cattle, Phosphorus, Solubility



**768 Practices and perceptions of cow-calf producers regarding the National Animal Identification System.** S. J. Breiner<sup>\*1</sup>, D. A. Blasi<sup>1</sup>, K. M. Boone<sup>1</sup>, T. C. Schroeder<sup>1</sup>, and S. A. Grau<sup>2</sup>, <sup>1</sup>Kansas State University, <sup>2</sup>Beef Magazine.

The proposed U.S. National Animal Identification System (US-NAIS) has generated many concerns among beef cattle producers. The goal of the NAIS is to utilize 48-hour traceback in the event of an animal disease outbreak. The traceback would identify all animals that have had contact with the diseased animal, while linking an animal to its premise of origin. According to the Diffusion of Innovation theory, getting a new idea adopted, even when it has clear advantages, is often very difficult. However, by adopting innovations relatively sooner than others in their system, the theory shows marked benefits for innovators and early adopters, as well as a widening of the socioeconomic gap. A national study was conducted at Kansas State University to gauge beef producer acceptance and adaptability to implement the US-NAIS.

Participants were selected in the spring of 2006, from a mailing list of cow-calf producers with more than 100 head of cows. *BEEF*<sup>®</sup> Magazine provided the mailing list and a random sample of 1,000 producers was selected. The results show a knowledge gap between the proposed system and producer understanding. Producers were also divided on support for the proposed system. When ranking their level of support on a scale of 1 to 6, with 1 being strongly supportive and 6 being strongly opposed, 49% of producers showed some level of support and 48% showed some level of opposition. Data shows a mean of 3.53 with a standard deviation of 1.672. Data also highlights a lack of understanding of the regulations and implementation procedures among producers. The results of this study brought considerable insight into the current practices and perceptions of beef cattle producers, and will be used to develop educational materials to improve their understanding of this proposed program.

**Key Words:** Animal Identification, Beef Cattle Producers, Radio

## Production, Management & the Environment - Livestock and Poultry: Livestock Production, Management, and Environment

### Frequency Identification

**769 Effect of littered systems on pollutant emissions into the air in gestating sows.** C. Pineiro<sup>\*1</sup>, G. Montalvo<sup>2</sup>, P. Illescas<sup>2</sup>, and M. Bigeriego<sup>3</sup>, <sup>1</sup>PigCHAMP Pro Europa, SA, Spain, <sup>2</sup>Tragsega, Spain, <sup>3</sup>Spanish Ministry of Agriculture, Spain.

During the last decade, the approach to environmental issues related to animal production is changing, including concepts such as emissions to soil, water, air and proper use of energy and water. In the EU Reference Document (BREF, 2003) on Best Available Techniques (BAT) for Intensive Rearing of Poultry and Pigs several techniques were proposed for emissions abatement. In Spain, a project financed by the Spanish Ministry of Agriculture, Fisheries and Food was planned to evaluate the BAT proposed by the BREF under Spanish conditions. The aim of the present work was to assess one of the BAT proposed for gestating sows, the littered systems (straw based) using good practices (enough straw, changing the straw frequently, functional areas) on gas emissions. The study was performed in a commercial farm using 60 gestating sows housed in two different rooms during four weeks. In the first room, the reference system was implanted (total-slatted floor over deep manure channel and monthly removal); whereas in the second room, concrete floor was applied and 360 kg of straw were scattered over the floor (3 kg per sow and week). The concentration of the NH<sub>3</sub>, N<sub>2</sub>O and CH<sub>4</sub> (by means of semi-continuously monitoring using an Innova 1312 multi-gas monitor; SIR, SA, Spain) in each room were measured. The solid concrete floor system with straw reduced the average NH<sub>3</sub> (11%, P<0.05), and CH<sub>4</sub> (66%; P<0.01) in comparison with the reference system. However, N<sub>2</sub>O emissions increased by 190% (P<0.001) in the littered system. From these results, we conclude that despite ammonia emissions are reduced, an important greenhouse gas (N<sub>2</sub>O) is hugely increased. Moreover, associated costs were extremely high (extra costs was 47.6 - 55.4 euros/place and year for new installations, and 72.7 - 80.5 euros/place and year for existing installations) because of the cost of straw and the required extra labour. Hence, harmonization of this directive with others affecting animal husbandry (Council Directive 98/58 CE) should be carefully performed to avoid the impairment of environmental performance.

**Key Words:** Gestating Sows, Ammonia, Littered Systems

**770 Effect of different dietary strategies on productive performance and gas emissions in post-weaned piglets.** G. Montalvo<sup>1</sup>, C. Pineiro<sup>\*2</sup>, J. Morales<sup>2</sup>, S. Godbout<sup>3</sup>, S. P. Lemay<sup>3</sup>, M. Belzile<sup>3</sup>, J. Feddes<sup>4</sup>, P. Illescas<sup>1</sup>, M. Bigeriego<sup>5</sup>, and C. de Blas<sup>6</sup>, <sup>1</sup>Tragsega, Spain, <sup>2</sup>PigCHAMP Pro Europa SA, Spain, <sup>3</sup>IRDA, Canada, <sup>4</sup>U. Alberta, Canada, <sup>5</sup>Spanish Ministry of Agriculture, Spain, <sup>6</sup>UP Madrid, Spain.

The objective of this study was to assess the effects of different dietary strategies on post-weaned piglets performance and gas emissions. Dietary strategies assessed were low-protein content (LP, 16.6%CP), soluble fibre through sugar beet pulp inclusion (SBP, 10%) and acidification adding benzoic acid (BA, 5%). A total of 80 piglets were fed on five different isoenergetic diets: control diet, LP, SBP, BA, and the combination of all (LP+SBP+BA) during four weeks. Ten environmentally-controlled chambers, each housing eight piglets (13.1 kg initial BW, F1 cross (Yorkshire × Landrace) × Duroc) were used to monitor: average daily gain, ADG; average daily feed intake, ADFI; gain:feed ratio, G:F, airflow rate, NH<sub>3</sub>, CH<sub>4</sub>, and N<sub>2</sub>O concentrations. G:F differed among treatments, being higher in LP+SBP+BA groups (0.46 vs 0.55 kg/kg in LP+SBP+BA and control groups, respectively; P<0.05). This effect was due to both a lower ADG compared with SBP and BA groups (532 vs 628 as average g/d; P<0.05), and higher ADFI compared with that of the control group (1.16 vs 1.05 kg/d; P<0.05). Also showed higher ADFI than control group (1.15 as average vs 1.05 kg/d; P<0.05), but no differences were found in G:F or ADG among any individual dietary strategy and the control group. Ammonia emissions from the control diet were 0.9 mg/h/kg pig, and similar to the BA diet, but the LP, SBP and LP+SBP+BA diets had emission rates about 50% lower with respect to control diet (P<0.05). For CH<sub>4</sub>, the control diet showed an emission of 0.851 mg/h/kg pig, whereas the LP diet decreased emission rates about 40% (P<0.05). Other treatments had not effect on the emission rates of this gas. Nitrous oxide emissions were similar for all treatments (around 0.017 mg/h/kg pig), except for LP+SBP+BA diets where emissions reached 0.028 mg/h/kg pig. These results show that changes in nutrition may help to control emissions to the atmosphere, without affecting animal performance.

J. Anim. Sci. Vol. 85, Suppl. 1/J. Dairy Sci. Vol. 90, Suppl. 1/Poult. Sci. Vol. 85, Suppl. 1/Piglet, Nutrition, Gas Emissions