Compared to fluids, the particulate digesta showed higher counts of fibrolytic bacteria and enzyme activities (P<0.05), whereas the latter were stronger enhanced by reducing dietary PS (P<0.05). Results of this study indicate that reducing PS of CS in a TMR has the capacity to increase fiber degradation in the rumen of dairy cows, particularly by stimulating the activities of fibrolytic enzymes rather than increasing the total count of fibrolytic bacteria.

Key Words: Ruminal Fermentation, Fibrolytic Bacteria, Dairy Cow

792 Nutrient digestibility and utilization in non-lactating fistulated cows fed diets containing ratios of untreated corn silage and Silo-King®treated alfalfa haylage. G. A. Ayangbile*, D. Spangler, D. Jones, and K. Thompson, *Agri-King, Inc.*, *Fulton, IL.*

It is a common practice in most dairy operations to feed diets consisting of two or more types of forages. On some farms, choices are made to ensile corn silage (CS) with or without any additive. However, it is of greater risk to ensile alfalfa without any additive. This study evaluates nutrient digestibility and utilization in non-lactating fistulated cows fed a TMR containing varing ratios of untreated CS and Silo-King® treated alfalfa haylage. Cows were arranged in a 4 × 4 latin square design. Diets consisted of a) 80% untreated CS and 20%, treated alfalfa haylage (80:20, CS/Hlg), b) 60:40, CS/Hlg, c) 40:60, CS/Hlg, and d) 20:80, CS/Hlg. Each period consisted of 16 d adaptation to diets, and 5-d collection. Total fecal collection was obtained per cow, and random spot urine samples were collected before (0 h) and after (4 h) feeding. Rumen fluid and blood samples were collected at 0 h and 4 h. The amino acids composition expressed as percentage of insoluble crude protein were higher for the TMR containing lowest inclusion of haylage. DMI ranged from 31.2 lb DM to 33.5 lb DM. Total DM fecal output (14.5 lb) was highest (P<.05) for 80:20, CS/Hlg and lowest (11.1 lb) for the 20:80, CS/Hlg. Digestibilities for DM, NDF, ADF, and starch were greater (P<.05) for 40:60 and 20:80, CS/Hlg TMR. Blood glucose (P<.05), ammonia, rumen valeric and isoacids were increased (P<.05) with higher haylage ratios in TMR. Results indicate the benefits of replacing portion of a diet containing an untreated corn silage with a higher level of treated alfalfa haylage. There were greater digestibility and utilization of organic and inorganic nutrients.

Key Words: Treated Forages, Fecal Output, Digestibility

Swine Species

793 Effects of a ground raw soybean diet on reproductive performance in gilts. D. Sykes*, K. Necaise, W. Brookshire, P. Gerard, F. Cunningham, M. Crenshaw, and P. Ryan, *Mississippi State University*, *Mississippi State*.

Raw soybeans contain high levels of phytoestrogens (i.e., genistein), which are bioactive compounds known to enhance ovarian function in sows, but little is known about the use of raw soybean diets on reproductive performance in gilts. Thus, the objective of this study was to examine the effects of a raw soybean diet on pregnancy outcome and weaning performance of gilts. To this end, prepubertal Yorkshire x Landrace gilts (n=20; BW 73.6 ± 1.1 kg; age 140 d) were assigned to balanced isonitrogenous (CP 14%) and isocaloric diets using either soybean meal (SBM; n=10) or ground raw soybean (RSB; n=10) as the protein (100%) supplement source. Gilts were housed in covered outdoor pens with ad libitum access to feed and water and monitored daily (from 160 d of age) for estrus using a teaser boar then bred by AI on the third standing estrus using the AM/PM rule. After breeding, gilts were penned individually indoors and restricted to their respective diets (2.23 kg/day) through to d 111 of gestation when they were placed in farrowing crates and maintained on a lactation diet until weaning. There was no difference (P > 0.10) with respect to diets on age of gilts at time of first estrus (RSB 193.2 d ± 6.86; SBM 188.4 d ± 5.97) or breeding (RSB 235.6 d ± 7.51; SBM 230.1 d ± 6.82). All but three gilts in the RSB group conceived on first AI. There was no difference in the average number of pigs born to gilts (RSB, 13.2 ± 1.29; SBM, 13.8 ± 0.59 pigs) or on the number of mummified fetuses and stillborns. Mean litter birth weights (RSB, 1.34 ± 0.08; SBM, 1.41 ± 0.05 kg) and placenta weights (RSB, 3.35 ± 0.41; SBM, 3.75 ± 0.22 kg) were not different. While there was a difference (P < 0.05) in the mean number of pigs weaned per litter (RSB, 8.90 ± .80; SBM, 11.80 ± 0.59 pigs) there were no differences in the average weaning weight of pigs (RSB, 7.90 ± 0.45; SBM, 7.50 kg ± 0.31 kg). There was an observed but not significant difference in time to return to estrus post-weaning of sows (RSB, 18.0 ± 4.59; SBM, 13.9 ± 4.79 d). These studies indicate that feeding raw soybeans as a protein dietary supplement source is not detrimental to reproductive performance in gilts.

Key Words: Raw Soybeans, Gilts, Reproduction

794 Effect of feeding Luctarom "S" 55972Z® on sow reproductive performance. D. Towey[1], J. Sonderman[2], D. Reese*[1], D. Travnicek[1], and K. Eskridge[1], [1]*University of Nebraska, Lincoln*, *Lincoln, NE*, [2]*Danbred North America*, *Columbus, NE*.

The objective of this study was to determine the effects of feeding Luctarom "S" 55972Z® (Lucta S.A., Barcelona, Spain) and maternal line on sow reproductive performance. Luctarom is a product with a milky flavor and strong cured cheese and vanilla bottom notes. Treatments were arranged as a 2 x 2 factorial with diet and maternal line as factors. Diets were corn-soybean meal based containing 1.2% total lysine, 3,260 kcal of ME/kg and 3% added fat, with or without Luctarom. Parity two to nine line 241 and 482 Danbred N.A. females (n=176) were used at a parity-segregated commercial farm. Control or Luctarom feed (containing 0.075% Luctarom) was introduced to sows when they were moved into the farrowing quarters 4d before farrowing. Sows remained on their respective dietary treatment until weaning (average 16.8 d of lactation). Prior to farrowing, sows were limit-fed, but after farrowing they were allowed ad libitum access to feed until weaning. Each sow's allotment of feed was weighed prior to dispersal. Feed disappearance was calculated the next morning by weighing any feed that remained in the feeder. All data were analyzed using analysis of covariance with parity as a covariate. In addition, day was treated as a repeated measure for the feed disappearance data. Feed disappearance before (2.36 vs. 2.52 kg/d; P = 0.222) and following farrowing (6.79 vs. 6.79 kg/d; P = 0.989) was similar for control and Luctarom fed sows, respectively. During the prefarrowing

phase, line 482 sows made more feed disappear than line 241 sows (2.67 vs. 2.19 kg/d; P = 0.010). However, during lactation feed disappearance was not different between the lines (P = 0.865). Total number of pigs born/litter (13.35 vs. 13.90; P = 0.353) and number born alive (12.21 vs. 12.66; P = 0.429) were similar for control and Luctarom fed sows, respectively. Luctarom did not improve sow feed disappearance or reproductive performance.

Key Words: Sows, Feed Intake, Flavor

795 Supplemental microbial phytase effects the expression of intestinal and liver mineral transporters in the iron/zinc deficient pig. E Tako*, R. P Glahn, R. M Welch, X Lei, and D. D Miller, *Cornell University*, *Ithaca, NY*.

Over 50% of phosphorous in beans is in the form of phytate that is poorly available. Phytases, catalyze the stepwise removal of inorganic orthophosphate from phytate. Since bioavailability of iron and zinc in foods of plant origin is a function of phytate concentration, we hypothesized that enhanced dietary phytate phosphorus utilization by supplemental microbial phytase might also produce simultaneous improvements in the bioavailabity of zinc and iron in red and white beans based diets, and by that means effect iron/zinc related transport protein gene expression in the iron/zinc deficient pig. Iron deficient piglets at age 4 wks were divided into 5 treatment groups (n=4): 1. Standard corn-soy diet (control); 2. 50% white bean diet ; 3. 50% red bean diet ; 4. 50% white bean diet + 1000 units phytase/kg diet; 5. 50% red bean diet + 1000 units phytase/kg diet. Diets 2-5 had no supplemental iron/zinc. After 30 days, animals were killed and sections of tissue from the duodenum and liver were collected for analysis of expression of iron transport genes. Semi quantitative RT-PCR used to evaluate relative expression of DMT1, Dcytb, ZnT1, mucin, ferritin and ferroportin. In the duodenum, DMT1 and Dcytb expressions were higher ($P \leq 0.05$) in the controls compared to all other groups. ZnT1 and mucin expressions were higher ($P \leq 0.05$) in groups 2, 4 compared to other groups. Ferritin and ferroportin expressions did not differ between treatments. As for the liver, ZnT1 and ferritin expressions were increased ($P \leq 0.05$) in treatment 4 compared to other treatments. These results suggest that supplemental dietary phytase may affect genes encoding for iron and zinc transporters and in this way enhance iron and zinc absorption by enterocytes. Support- HarvestPlus.

Key Words: Pig, Phytase, Gene Expression

796 Effects of dried distillers grains and NCKP soybean meal on growth performance and fat quality characteristics of growing/finishing pigs. J. M. Benz*, M. D. Tokach, S. S. Dritz, J. L. Nelssen, J. M. DeRouchey, and R. D. Goodband, *Kansas State University*, *Manhattan*.

A total of 111 barrows (maternal line PIC 1050) with an initial BW of 47.9 kg were used in an 83-d trial to study the effects of dried distillers grains (DDGS) and extruded expelled soybean meal (EESM) on growth performance and fat quality. Pigs were blocked by weight and randomly allotted to one of six treatments with two pigs per pen and nine pens per treatment. Diets were: a corn-soybean meal control diet with no added fat; corn-EESM diet with no added fat; corn-EESM diet with 15% DDGS; corn-soybean meal diet with 15% DDGS and 1.55% choice white grease (CWG): corn-soybean meal diet with 3.25% CWG; and corn-soybean meal diet with 4.7% CWG. Diets were formulated to have three dietary iodine value (IV) levels (42, 55, and 62) to compare the impact of fat source within dietary IV levels. On d 83, jowl and backfat samples were collected. Pigs fed 4.7% CWG had increased ADG compared with pigs fed either diet containing 15% DDGS. Pigs fed EESM with 15% DDGS or the diets with 3.25 or 4.7% CWG had increased G:F compared with pigs fed the control. Pigs fed either of the diets with 15% DDGS had increased backfat IV compared with pigs fed diets without DDGS. Pigs fed EESM had increased backfat IV when compared with the control diet or diets with 3.25 or 4.7% CWG. Adding DDGS to the diet or using EESM increased IV of jowl fat. Adding CWG to the control diet also increased IV of jowl fat. Feeding ingredients with higher levels of unsaturated fat, such as EESM and DDGS, had a greater impact on fat IV than CWG even when diets were formulated to similar IV levels.

Table 1.

Item	Control	EESM	EESM + DDGS	1.55% CWG + DDGS	3.25% CWG	4.7% CWG
Calculated Diet IV	42	55	62	55	55	62
ADG, kg	0.95^{ab}	0.95^{ab}	0.91^{a}	0.92^{a}	0.94^{ab}	1.00^{b}
ADFI, kg	2.88^{c}	2.74^{bc}	2.56^{a}	2.68^{ab}	2.61^{ab}	2.67^{ab}
G:F	0.33^{a}	0.35^{ab}	0.36^{b}	0.34^{ab}	0.36^{b}	0.37^{b}
BF IV	59.9^{a}	65.0^{b}	70.8^{c}	69.3^{c}	62.1^{a}	61.8^{a}
Jowl IV	64.6^{a}	68.8^{c}	72.3^{e}	70.2^{d}	66.3^{b}	67.1^{bc}
BF 18:2, %	11.2^{a}	14.5^{b}	18.4^{c}	17.3^{c}	11.8^{a}	11.9^{a}
Jowl 18:2, %	11.0^{a}	13.8^{b}	16.2^{c}	14.9^{bc}	11.6^{a}	11.9^{a}

^{abcde}Means differ (P<.05)

Key Words: Iodine Value, Dietary Fat, Pigs

797 Effects of a commercial sequestering agent on performances of fattening pigs fed diet artificially contaminated by aflatoxin B1 and ochratoxin A. G. Battacone*[1], G. A. Carboni[2], P. Nicolussi[2], C. Patta[2], and G. Pulina[1], [1]*Dipartimento di Scienze Zootecniche - University of Sassari*, *Sassari, Italy*, [2]*Istituto Zooprofilattico Sperimentale per la Sardegna*, *Sassari, Italy*.

The use of feed additives with mycotoxin adsorption capacity is a common strategy for controlling negative effects of mycotoxins in swine production systems. However, adsorbents that may results very effective under experimental conditions, i.e. when feed contamination level is rather high, do not necessarily retain their efficacy when tested under field conditions feed with generally low mycotoxin contamination. In this study the effects of diets artificially contaminated with aflatoxin B1 or ochratoxin A on fattening performance and serum chemistry of fattening pigs are investigated. Moreover, the ability of a commercial glucomannan polymer (Gm polimer) to reduce or eliminate the effects of the contaminated feeds is tested. Thirty heavy pigs (BW = 110±10.6 kg) were fed 6 diets (n = 5 pigs/diet) for 4 weeks until slaughtering. Diets were: control without toxin added (C); added with 0.02 ppm of aflatoxin B1 (AFB1); added with 0.05 ppm of ochratoxin A (OTA); other three diets as the previous but the addition of 2.0 g/kg of Gm polymer (C-Gm, AFB1-Gm, OTA-Gm). Daily weight gain (ADG) and feed efficiency ratio were taken every two weeks. Data were analyzed with two-way ANOVA that included the fixed effect of diet, time and their interaction. After the first 2 weeks the ADG did not differ significantly between the diets, even if the ADG of AFB1 diet was about 20% lower than AFB1-Gm or C. In

the last 2 weeks the ADG of AFB1 diet was significantly lover than the other diets (P<0.01) and was about one-half of the values reported for the same group in the first period. The contamination with ochratoxin A did not affect fattening performance of pigs during the whole experimental period. No damages were found in kidneys of all diets. Moreover, no evidence of association between observed liver damages and different diets. Finally, no differences between experimental diets were evidenced for the haematological parameters. The research was supported by the project *Sicurezza e qualita' nella filiera suinicola regionale* funded by the Regional Authorities

Key Words: Pig, Mycotoxins, Glucomannan polymer

798 Ghrelin secretion is more closely aligned to the energy balance than with feeding behaviour in the grower pig. P. C. Wynn*, K. Scrimgeour, M. J. Gresham, P. Thomson, and R. E Newman, *Faculty of Veterinary Science University of Sydney*, *Sydney, NSW, Australia*.

Ghrelin secreted from the gastric fundus is thought to act as an initiator of feeding behaviour in the arcuate neurocircuitary of the hypothalamus across species. Thus this hormone has the potential to stimulate feed intake and therefore animal productivity. In our study we have evaluated changes in the circulating total ghrelin activity in response to different patterns of meal feeding over a 24h period and related these to insulin and metabolite status in grower pigs. Male Large White × Landrace pigs (57.5 kg) maintained at 22oC in a 12:12 light:dark lighting regime were offered a commercial pelletted ration (13MJ DE and 6.2g Lysine per kg) ad libitum for 7 days. Blood samples were collected hourly for 24h from indwelling ear vein catheters without restraint. Animals were then offered 95% of ad libitum feed intake in 2 meals (1 hour each) at 0900 and 1600h daily for 2 days. Animals were then bled hourly for 12 hours over the 2 feeding periods. The same protocol was repeated on the subsequent day with the exception that feed was provided only at 1600h. The 12h bleeding protocol was repeated on this day. During ad libitum feeding ghrelin status (Phoenix kit) remained constant for the 24h and was not related to either insulin, glucose or free fatty acid profiles. Similarly ghrelin status did not change when animals were offered their feed as 2 meals nor as a single meal. However it was associated with a gradual rise in FFA status during meal feeding. In contrast insulin status changed in line with the increased glucose following each meal. Our results suggest that ghrelin is not an acute regulator of feeding in grower pigs.

Key Words: Ghrelin, Feeding, Pigs

Teaching/Undergraduate & Graduate Education: From Choosing a Graduate Program to Embarking on a Successful Career: A Guide for Livestock and Poultry Science Students

799 Choosing a graduate program. D. R. Notter*, *Virginia Polytechnic Institute and State University*, *Blacksburg*.

Interest in graduate education in the animal sciences is widespread among both new graduates and midcareer professionals, and graduate training opportunities in the field are becoming more diverse. Students therefore need to develop a clear understanding of their training goals and be proactive in identifying opportunities consistent with those goals. Most land-grant universities provide excellent educational opportunities for motivated undergraduates, but the choice of an individual to act as graduate advisor is critical. Consultation with faculty at the student's home institution is usually the first step in choosing a graduate program. Departments can facilitate these discussions in seminar classes and workshops. On-line resources are useful, but students should also initiate communication with prospective advisors early in the application process. Few things warm the heart of a prospective major professor more than a well-composed, grammatically correct message from a prospective student expressing enthusiasm and understanding regarding an area of study. Students should likewise expect clear signals about deadlines, funding options, and potential research areas. In most cases, if a message to a prospective advisor does not elicit a reply, look elsewhere. Recent trends in graduate education include increasing emphasis at many universities on retention of their own undergraduates and growing preferences for doctoral students. Yet we often advise students to change institutions and to complete an M.S. before embarking on the Ph.D. A critical aspect in comparing graduates program involves visiting the campus to meet prospective advisors and current students. The objective is to find out if students in the program are doing things that you aspire to do. Strong programs have students that are engaged, enthused, and mentored, with clear understanding of the expectations of their program and the relevance of their research. A campus visit provides opportunity to ask existing students about their relationship to the department and assess the extent to which they feel respected and valued.

Key Words: Advising, Graduate education, Teaching

800 Research and teaching: what else? The unwritten guide to graduate school. C. C. Taylor-Edwards*, *University of Kentucky*, *Lexington*.

What makes a successful graduate student? Graduate school is all about taking classes, teaching, and research, so these must make you successful, right? Many employers may disagree. Several of the skills that employers desire in a new hire are lacking in graduate students. Graduate students often have poor communication skills, the tendency to avoid risk, a lack of vision, and a failure to understand the value of time. However, with the awareness and willingness of the graduate student, the process of graduate school can develop a core set of competencies that can be transferred successfully to a multitude of careers. This set of skills includes time management, effective presentation communication, interpersonal relationship building, goal-setting and prioritizing, organization, and independence. These