1867 Evaluation of resistance to H. contortus in Pelibuey sheep. Antonio Figueroa, Danilo Mendez*, Manuel Berruecos, Rogelio Alonso, and Hugo Perez, *Facultad de Medicina Veterinaria y Zootecnia. Universidad Nacional Autonoma de Mexico.*

The objective of this study was to identify Pelibuey sheep resistant to H. contortus. The resistance criterion used was fecal egg counts during an experimental infection of 42 days. Fifty-three Pelibuey lambs of 5 months of age (22 males and 31 females), free of nematodes, were infected with 3,000 larvae of H. contortus. Lambs were monitored every week for fecal egg counts (FEC), hematocrit value (HV), plasma protein level (PP), eosinophil counts (EC) and total weight gain (TWG). On day 42 post-infection, lambs were drenched and then evaluated every 28 days for a year under natural infection conditions. The degree of resistance was determined using the average of the last four egg counts during the experimental infection. Data was normalized by a $\log_{10}$ transformation. Statistical analysis of the data was carried out through an analysis of variance. The classification criterion used was the transformed mean minus one standard deviation (criteria equivalent in actual count=1,200 egg counts for males and 1,161 for females). Animals with an average FEC above the criterion were classified susceptible and animals below the criterion were classified resistant. Results showed that 45% of the males and 42% of the females were resistant. Resistant males had an average FEC, HV, PP, EC, and TWG of 752125, 27.6.7, 6.7.1, 2913, and 331.2 kg, respectively. Susceptible males had an average FEC, HV, PP, EC, and TWG of 1072368, 26.2.4, 6.8.1, 23532, and 322.4 kg, respectively. However, no significant differences were found for any these parameters with the exception of FEC (P<.05). Resistant females had significantly lower FEC compared to susceptible females (33342 vs 89397, respectively, P<.05). No other significant differences were found between resistant and susceptible females. Values for the studied parameters for resistant and susceptible females were: HV, 26.9.5 vs 26.7.5; PP, 7.2.3 vs 6.8.3; EC, 310106 vs 34430; and TWG, 9.6.4 vs 11.85.4, respectively. These data suggest that while variability in FEC exists in Pelibuey, this variability is not strongly associated with differences in HV, PP, EC, or TWG in resistant vs susceptible lambs.

Key Words: H. contortus, Resistance, Sheep

1868 Pre-mating nutrition affects the onset and synchrony of oestrus in Merino ewes treated with progesterone CIDR dispensers. SP Quigley*[1], SK Walker[1], PA Speck[1], SR Barritt[1], and DO Kleemann[1], [1]*South Australian Research and Development Institute, South Australia.*

Nutrition is a key factor controlling reproductive performance of the ewe. This study examined the effect of long term nutritional manipulation prior to insemination on the timing and incidence of oestrus in Merino ewes synchronised with controlled internal drug release (CIDR) devices containing 0.3g progesterone. Mature age Merino ewes (n=119) were stratified on liveweight and randomly allocated to 2 nutritional treatments of 1.8 and 0.6 times maintenance requirements (High (H) n=60 and Low (L) n=59, respectively). Ewes were fed a pelleted diet (60% roughage: 40% grain plus additives) for 12 weeks prior to joining. CIDR devices were inserted for 14 days with oestrus observations commencing 24 h after CIDR removal. Oestrus was recorded three times daily (08:00h; 12:00h; 16:00h) on three consecutive days. Ewes were inseminated via laparoscopy using fresh semen collected from a single Poll Dorset ram. Ewe liveweight and condition score between the treatment groups diverged significantly from 8 weeks prior to joining and throughout pregnancy (p<0.01). Low level of nutrition significantly delayed onset of oestrus (p<0.01); oestrus was detected 57±1.8 and 41±1.6 h after CIDR withdrawal in L and H ewes respectively. Better synchronisation of oestrus was observed in H ewes, with 72% of ewes detected in oestrus between 24-48 h after CIDR withdrawal, compared with 23% of L ewes. The percentage of H ewes detected in oestrus over three days tended to be higher (95%) than L ewes (81%) (p=0.08). For ewes detected in oestrus and inseminated, pregnancy rate tended to be higher in H ewes (72.7%) than in L ewes (51.1%) (p=0.08). Litter size did not differ between H (1.55±0.08 fetuses/ pregnancy) and L ewes (1.36±0.1). These results indicate that long term nutritional status of the ewe flock prior to a artificial insemination/ embryo transfer program has important implications for achieving satisfactory synchronisation of oestrus and ewe fertility.

Key Words: Sheep, Nutrition, Oestrus synchrony

1869 The effects of offering grass or maize silages with a flat rate of concentrate supplementation to pregnant ewes on ewe and lamb performance. T.F. Crosby*, J.V. O'Doherty, P.J. Quinn, J.J. Callan, B. Flynn, D. Cunningham, P. Reilly, and E Massey, *University College Dublin, Belfield, Dublin 4, IRELAND.*

Individually fed twin-bearing ewes (n=64) were offered either grass silage (T1) or maize silage (T2) ad libitum and supplemented with a daily flat rate of 400g concentrates from day 92 of pregnancy until lambing, in order to evaluate pregnant ewe and lamb performance and colostrum yield and quality. Overall daily forage DM intake was lower in the ewes fed grass silage (0.95 vs 1.11kg/ewe; SEM. 0.041; P<0.05) and this was directly reflected in lower (P<0.05) metabolizable energy intake, although these ewes had a higher daily crude protein intake (178 vs 169g/ewe/d; SEM. 3.2; P<0.05). The ewes in T1 gained less liveweight (10.93kg vs 12.90kg; P<0.05), lost more body condition (0.22 vs 0.08; SEM. 0.043; P<0.05) and had a longer gestation length (148.1 v. 146.4 days; S.E.M. 0.34; P<0.001) than the ewes offered maize silage. Despite the difference in gestation length between the two forage types there was no difference in terms of total litter weight (9.87kg vs 9.53kg; SEM. 0.237kg; P>0.05). The type of forage fed had no effect on colostrum yield at 1, 10 or 18 hours post-lambing or on total yield at 18 hours post-lambing (P>0.05). The ewes on the grass silage based diet produced colostrum at 1 hour with a lower total solids concentration than the ewes fed maize silage (410.4 vs 465.1g/l; SEM. 16.39g/l; P<0.05). The forage treatment had no effect on the yield of colostral total solids, crude protein, IgG concentrations or IgG yield (P>0.05); lamb serum IgG concentration; or the efficiency of IgG absorption in the first 24 h. The type of forage fed to the ewes had no effect on lamb birth weight, lamb weight at five weeks or average daily gain from birth to five weeks (P>0.05). In conclusion the balance of advantages favours the use of maize silage for pregnant ewes especially in relation to ewe weight and body score changes but these advantages did not reflect themselves in colostrum or any of the lamb parameter data measured.

Key Words: Sheep, Silage, Lamb

1870 An evaluation of production systems for early season lamb production. T.F. Crosby, J.V. O'Doherty, P.J. Quinn, J.J. Callan, B. Flynn, and D. O'Shea, *University College Dublin, Belfield, Dublin 4, IRELAND.*

Following lambing, estrus synchronised ewes (n=137) and their lambs (n=239) were divided into four treatment groups and offered diets based on grass (T1), mixed brassica crop (swede/kale mixture) (T2), grass silage (T3), and maize silage (T4) in order to evaluate growth rate and carcass parameters. These forage-based diets were supplemented with concentrates in early lactation. The lambs had access to concentrates from the age of fourteen days and were selected for slaughter between 36 and 42 kg live weight. Concentrate creep consumption was 59.5, 44.9, 55.7, and 59.4 kg for T1-T4, respectively. Lamb growth rate (g/day) from birth until slaughter was 351, 335, 340, and 356 (SEM 9.7) for T1-T4, respectively, with lambs on maize silage growing faster than those on brassicas (P<0.05). Similarly, lamb age at slaughter for T1-T4, respectively, was 98.6, 101.5, 99.9, and 95.0 days (SEM 2.49) with lambs on the maize silage-based diet slaughtered earlier than lambs on either the brassica crop or the grass silage (P<0.05). Mean lamb live weight at slaughter ranged from 38.7 to 40.1 kg with lambs on the brassica treatment being lighter than all other treatments (P<0.01). Carcass weight (kg) for T1-T4 was 18.4, 18.7, 18.6, and 19.0, with dressing percentages of 46.8, 47.5, 47.3, and 48.2 (SEM 0.45), respectively. Lambs on maize silage (T4) had a higher dressing percentage than those on grass (T1) (P<0.01) and grass silage (T3) (P<0.05). Treatment had few significant effects on conformation, fat score, fat colour, or fat hardness. Lambs in T1 and T4 were sold earlier than in other treatments (P<0.05). Ewes offered the maize silage-based treatment had higher DM intakes and lost less weight and body condition (P<0.05). These results show the considerable superiority of maize silage over grass silage for suckling ewes

and their lambs but, in relation to lamb growth rate, the outdoor grass-based system (T1) was equally good. The lower creep intake of the lambs on the brassica-based treatment (T2) was probably a reflection of the highly succulent nature of this crop.

Key Words: Ewe, Lamb, Growth

1871 Feedlot performance, wool production, and carcass characteristics of Merino/Rambouillet wether lambs as affected by breed and dietary forage to concentrate ratios. S. L. Lake*, H. S. Hussein, H. A. Glimp, B. D. Kindred, T. P. Ringkob, and D. W. Holcombe, *University of Nevada - Reno*.

The objective of this study was to determine the effects of sheep breed and finishing diet on feedlot performance, wool production, and carcass characteristics of lambs. Forty lambs (initial BW = 42.47 kg) from two breed (Merino [M]/Rambouillet [R]) combinations (20 each) were assigned at random to 2 dietary treatments in a completely randomized design experiment. Treatments were arranged as a 2 × 2 factorial. The main factors were 2 breed combinations (.5 M-.5 R or .875 M-.125 R) and 2 dietary forage (alfalfa pellets) to concentrate (cracked corn) ratios (i.e., high forage [HF; containing 60% alfalfa] and high concentrate [HC; containing 80% corn]). The diets contained 14.2 and 11.1% CP on DM basis, respectively. The lambs were housed in individual pens in a temperature-controlled room, had ad libitum access to feed, water, and salt blocks, and were harvested at 55.2 kg of BW. No interactions (P > .05) between lamb breed and diet were detected for any of the measurements evaluated. Therefore, results of the main factors were summarized. Feedlot performance and wool production were not affected (P > .05) by lamb breed but they were influenced (P < .05) by diet. Lambs fed the HF diet consumed more DM (1.69 vs 1.38 kg/d), gained faster (.29 vs .21 kg/d), and had higher gain/feed ratio (.171 vs .147). The wool data were derived from evaluation of wool produced in 10 cm × 10 cm midrib patches that were shorn at the beginning of the study. Lambs fed the HF diet produced less grease (8.1 vs 9.9 g) and clean (5.1 vs 6.4 g) wool. Carcass characteristics were not altered (P > .05) by the treatments. The only exceptions were less (P < .05) kidney, pelvic, and heart fat (2.6 vs 4.0%) and a tendency (P=.199) for better yield grade (1.77 vs 1.99) when lambs consumed the HF diet. Results suggest that finishing M/R wether lambs on HF diets (provided by alfalfa pellets) may be beneficial in reducing days on feed, improving efficiency, and producing carcasses with higher yield of boneless cuts. Increasing M genetics from .5 to .875 did not negatively affect lamb performance. Compared with recommended requirements (NRC, 1985), lambs were either consuming 30% more (HF) or 17% less (HC) CP. It appears that CP requirements of M/R lambs must be equal to or higher than those recommended (NRC, 1985).

Key Words: Sheep, Carcass characteristics, Finishing diet

1872 Comparison of carcass data and ultrasound measures using both cattle and swine standoffs for loin eye area, loin eye depth and external fat in lambs. B.D. Banks*, M.E. Benson, J.D. Cowley, G.C. Good, M.T. Shane, and T.M. Villumsen, *Michigan State University, East Lansing, MI/USA*.

The objectives of this study were to determine accuracy of ultrasound measures for loin eye area (LEA), loin eye depth (LED) and external fat at the 12^{th} rib (BF). Data were collected by real-time ultrasound (Pie 200 SLC, Pie Medical, Tequesta, FL) with cattle (USC) and/or swine (USS) standoffs. Ultrasound measures were compared to carcass measures. Commercial ewe and wether lambs (n=120) born in 1999 and 2000 were harvested at an average weight of 59.36.0 kg. Post-harvest LEA, LED and BF were measured on the carcasses. Actual carcass LEA averaged 17.74 cm^2 (n=120), USC LEA averaged 18.39 cm^2 (n=119), and USS LEA averaged 17.87 cm^2 (n=56). The range in standard deviations across all measurements was 1.94 to 2.26 cm^2. Actual carcass LED averaged 3.23 cm (n=68), USC LED averaged 2.97 cm (n=68), and USS LED averaged 3.12 cm (n=30). Standard deviations ranged from 0.18 to 0.30 cm. Mean carcass BF was 0.69 cm (n=120), average USC BF was 0.48 cm (n=119), and average USS BF was 0.51 cm (n=56). Standard deviations ranged from 0.13 to 0.25 cm. Correlations between carcass LEA and ultrasound measurements were .30 and .57 for USC LEA and USS LEA, respectively. The correlations between carcass LED and ultrasound measurements were .52 and .68 for USC LED and USS LED, respectively. Carcass BF was correlated with USC BF (0.69) and USS BF (0.78). The linear regression coefficients for carcass LEA on USC LEA and USS LEA were 0.278 (P<0.01) and 0.550 (P<0.01), respectively. The regression of carcass LEA on USC LED and USS LED were 1.963 (P<0.01) and 2.737 (P<0.01), respectively. Carcass BF linear regressions on USC BF and USS BF were 1.348 (P<0.01) and 1.369 (P<0.01), respectively. Both standoffs overestimated the average carcass LEA and underestimated carcass BF. The swine standoff predicted carcass LEA, LED and BF closer to carcass estimates.

Key Words: Sheep, Lamb carcass, Ultrasound

ASAS Swine Species

1873 Lysine requirement of growing (35.1 to 60.5 kg) pigs, when formulated on ideal protein basis. I. Moreira*, M. Kutschenko, A.C. Furlan, A.E. Murakami, E.N. Martins, and C. Scapinello, *Universidade Estadual de Maringa, Maringa-PR, BRAZIL*..

An experiment was performed to determine the optimum lysine (total) level in the diet of the growing pigs when formulated on ideal protein basis. A corn-soybean meal basal diet contained 13% crude protein, 3.4 Mcal of digestible energy/kg and 0.75 % lysine. Treatment diets were supplemented with .15, .30, .45% of lysine to attain dietary concentration of .90, 1.05 and 1.20% lysine (total). Crystalline methionine, threonine and tryptophan were added in all diets to maintain constant, ratios of these essential amino acids to the lysine content in each treatment diet. All other nutrients met or exceeded NRC (1998) nutrient requirement of pigs. Thirty-two crossbred pigs with an average body weight of 35.1 kg were blocked by weight and randomly assigned to the four experimental diets for a 28-d growth study. The experiment was a randomized complete design and was conducted in four replicates, with two pigs per experimental unit (pen). Pigs had access to their treatment diets on an ad libtum basis. Pigs were weighed, pen feed intakes determined and individual pig blood samples taken every 14 days. Plasma urea nitrogen (PUN) was determined. Backfat thickness (BF) was obtained using ultrasound on live pigs at the end of the growing phase. Gain:feed and backfat thickness were not affected by lysine levels The regression models estimated the total lysine (%) requirement to be .90, .89 and 1.03% when average daily feed intake, average daily gain and PUN, are the measurement criteria respectively.

Key Words: Amino Acid Requirement, Ideal Protein, Pigs

1874 Substituition of Corn to Cofee Hulls in a Isoenergetic Diets for Growing and Finishing Pigs. E. T. Fialho*^{UFLA}, V. Oliveira^{UFLA}, J. A. F. Lima^{UFLA}, and R.T. Freitas^{UFLA}, [1]*Universidade Federal de Lavras - UFLA/BRAZIL*.

A metabolism assay and a performance trial were carried out at the University of Lavras (UFLA) in Brazil in order to evaluate the technical and economical viability of substituition of corn with Coffee Hulls (DM 86.7%; CP 10.2%; FDN 55,0% and 2500Kcal DE/Kg) in isoenergetic growing and finishing pig diets. The metabolism assay was conducted utilizing 24 crossbred (LDxLW) barrows with 12 in the growing phase (34.8 Kg) and 12 in the finishing phase (60.7 Kg) which were randomly assigned to a metabolism cage with six replicates per phase. In the performance trial a total of 96 crossbred (LDxLW) barrows and gilts with mean initial weight of 34.4 Kg were utilized. The experiment was in a randomized block design with four treatments and six replicates with pigs distributed in a pen with four pigs (2 barrows and 2 gilts). The treatments consisted of the inclusion of Cofee Hulls (CH) at 0.0;5.0;10.0 and 15.0%, replacing corn in isoenergetic diets (16% and 14% CP and 3350 Kcal DE/Kg) for growing and finishing phases, respectively. Increasing the level of CH decreased linearly (P<0.01) the digestibilities of nutrients as well as energetic values (DE and ME) of the diets. The performance assay showed that weight gain decreased linearly (Y=876.3-13.17 R=0.932) and feed intake decreased linearly (Y=2.685-34.26, R=0.899) with increasing CH. Considering the price of corn and CH in January/2001 the use of Coffee Hulls was technically