

T244 Productive performance of Holstein cows in early and very early lactations when injected with bovine somatotropin. M. A Tarazon*¹, J. T. Huber², A. C. Calderon³, and H. G. Garcia³, ¹Universidad de Sonora, México, ²University of Arizona, Tucson, ³Universidad Autónoma de Baja California, Mexicali, Mexico.

The objective of the current study was to evaluate the effect of bovine somatotropin (bST) on milk yield and composition of Holstein cows in early and very early lactations. Twenty-two lactating Holstein cows averaging 62 days in milk (DIM:25-115), 28.5 kg/d milk, a body condition score (BCS) of 2.87, and 648.2 kg of body weight (BW), were assigned to one of the four treatments in a completely randomized design with a treatment arrangement of factorial 2x2. Cows were fed with the regular diet during the fourteen days of pretreatment and the 56 days of treatment periods. The treatments were: 1). VE, cows in very early lactation (25-56 DIM) without bST; 2). VES, cows in very early lactation with bST; 3). E, cows in early lactation (67-115 DIM) without bST; and 4). ES, cows in early lactation with bST. Variables were adjusted for covariance effects using the data from the 28-day pretreatment period and analyzed by the General Linear model Procedure (GLM) of SAS (1990). Results showed that bST tended (P<0.09) to increase milk yield (34.8 vs. 36.4 kg/d) in cows between 25 to 115 DIM, however the increase was significant when bST was injected to cows in early lactation (67-115 DIM). Neither the stage of lactation nor the injection of bST altered milk composition nor the rest of variables measured in the experiment.

Key Words: bST, Holstein, DIM

T245 Effect of type of concentrate on milk production and composition of dairy cows. R.G. Pulido*¹, P. Aguilera¹, R. Daetz¹, F. Wittwer¹, and P. Orellana², ¹Fac. Cs. Veterinarias, Universidad Austral de Chile, Valdivia, Chile, ²Depto. Nutrición, F. Med. Veterinaria, Universidad de Concepción.

Two experiments were carried out to evaluate the effect of two sources of carbohydrate (fibrous and starchy) and two levels of crude protein in

concentrate supplements (17.0% in exp 1 and 11.9% in exp 2) on milk production and composition of spring calving dairy cows. In exp 1, 12 multiparous Friesian dairy cows (BW 529 kg), yielding 33.0 l/d and at 53 days of lactation, were assigned to a 3x3 Latin square design with periods of 21 days. In exp 2, 30 multiparous Friesian dairy cows (BW 512 kg), yielding 29.3 l/d and at 65 days of lactation, were assigned to a continuous randomized design for 45 days. For both experiments the treatments included: grazing alone (TGO), grazing plus 6 kg/d of sugar beet pulp-based concentrate (TFC) and grazing plus 6 kg/d of cereal-based concentrate (TSC). The concentrates were balanced by CP and ME. The cows were supplemented twice a day and managed under a strip grazing system on pasture consisting mainly of perennial rye grass. During the last week of each period in exp 1 and during all period, in exp 2, milk production (MY) was recorded on a daily basis and milk composition on 4 occasions during each week. Throughout the trial BW was recorded weekly. The results for (MY) during exp 1 were 24.2, 28.5 and 29.8 l/d for treatments TGO, TCF and TCS, respectively (TGO vs. TCF or TCS, P<0.05; TCF vs. TCS P>0.05). Milk fat (MF) was 3.65, 3.44 and 3.40 %, respectively (P=0.06), milk protein (MP) was 2.88, 2.99 and 3.01 %, respectively (TGO vs. TCF or TCS, P<0.05; TCF vs. TCS P>0.05) and milk urea was 43.35, 41.01 and 43.89 mg/dl, respectively (P>0.05). The results for (MY) during exp 2 were 27.0, 28.9 and 31.0 l/d for treatments TGO, TCF and TCS, respectively (TGO vs. TCF or TCS, P<0.05; TCF vs. TCS P>0.05). (MF) was 3.59, 3.58 and 3.73 %, respectively (P>0.05), (MP) was 3.07, 3.30 and 3.14 %, respectively (TGO vs. TCF or TCS, P<0.05; TCF vs. TCS P>0.05) and milk urea was 48.59, 42.72 and 44.65 mg/dl, respectively (P<0.05). The results suggest that carbohydrate source did not affect the milk production and composition of dairy cows on this experiment.

Key Words: Grazing Cows, Milk Yield, Carbohydrates

Sheep Species

T246 Effect of substitution of alfalfa hay with sun dried pig excreta on performance of sheep feed growing diets. A. Estrada-Angulo*, C. H. Ramos, R. Barajas, and J. F. Obregon, FMVZ-Universidad Autonoma de Sinaloa, Culiacán-Mazatlan, Mexico.

With the objective of determining the effect of substitution of alfalfa hay with sun dried pig excreta on performance of sheep fed growing diets, a 56 days growing feeding experiment was conducted. Forty hair sheep (Males; BW=15±2 kg) were used in a complete randomized block experiment design. The animals were weighed and blocked by weight in groups of four. Groups were placed in eight pens (2 x 3 m) with a bare ground floor and designed to consume one of two diets that constituted the treatments: 1) Diet with 18% CP and 3.1 Mcal of DE/kg, containing 30% of alfalfa hay, sudan grass hay 10%, cracked corn 29.5%, soybean meal 13%, sugar cane molasses 14%, mineral premix 2.5% (Control); and 2) Diet similar to control, but containing 30% of sun dried pig excreta, that substituting entirely for the alfalfa hay. Diets were offered twice a day under free access condition. There was not effect (P=0.48) of treatments on end weight (23.60 vs. 23.28 kg for diet 1 and diet 2, respectively). The inclusion of pig excreta did not affect (P=0.73) the dry matter intake (0.773 vs. 0.775 kg/day for diet 1 and diet 2, respectively). The average daily gain was similar (P=0.62) for both treatments (152.25 vs. 148.75 g/day for diet 1 and diet 2, respectively). The feed intake/gain ratio was not altered (P=0.72) by treatment (5.16 vs. 5.13 for diet 1 and diet 2, respectively). It is concluded, that sun dried pig excreta can be used as partial substitute of roughage in diets for growing sheep.

Key Words: Pig Excreta, Growth Performance, Sheep

T247 Effect of substitution of sorghum grain for escobero sorghum grain (sorghum bicolor, var. Technicum, Jav.) on apparent digestibility of diets for sheep. A. Estrada-Angulo*, R. Barajas, J. F. Obregon, R. E. Lopez, and J. C. Robles, FMVZ-Universidad Autonoma de Sinaloa, Culiacan-Mazatlan, Mexico.

With the objective of determining the effect of substitution of sorghum grain for escobero sorghum grain (sorghum bicolor, var. Technicum, Jav.) on apparent digestibility of diets for sheep, a digestibility experiment by total fecal collection was conducted. Four pelibuey sheep, males (BW=22.75±0.32 kg) were used in a crossover design experiment. The animals were placed in individual metabolic crates (0.6 x 1.2 m), and randomly were assigned to consume one of two diets that constituted the treatments: 1) Diet with 15% CP and 3.4 Mcal of DE/kg, containing 45% of whole sorghum grain, sudan grass hay 22.5%, sesame meal 15%, sugar cane molasses 12%, poultry fat 3%, and 2.5% of mineral premix (Control); and 2) Diet similar to control but containing 45% of whole escobero sorghum grain (Sorghum bicolor var. technicum, Jav.), that substituted for sorghum grain of the diet (ES treatment). Diets were offered twice a day (800 and 1600 h), after a six days adaptation period, samples of diet (1 kg) and the total of feces produced were collected for four days. Samples were dried, weighed, and ground. The inclusion of escobero sorghum increased (P=0.01) the amount of DM excreted in feces (151 vs. 215 g/day for control and ES, respectively) and fecal excretion of crude protein (25 vs. 32 g/day for control and ES, respectively). ES decreased (P<0.01) by 15.5% dry matter digestibility of the diet (74.45 vs. 62.94% for control and ES, respectively). The crude protein apparent digestibility was 9.5% lower (P=0.02) in ES treatment (70.8 vs. 64.06% for control and ES, respectively). Digestible energy of the diet was diminished (P<0.01) 16% by ES (3.18 vs. 2.67 Mcal/kg for control and ES, respectively). Digestible energy content of sorghum bicolor, var. Technicum, Jav. was calculated to be 2.75 Mcal/kg and the true digestibility of its protein was calculated to be near 72%. It is concluded, that inclusion of sorghum bicolor, var. Technicum, Jav. decreased digestibility and DE content of the diet for sheep.

Key Words: Sorghum Grain, Digestibility, Sheep

T248 Effect of substitution of sorghum grain with escobero sorghum grain (*Sorghum bicolor*, var. *Technicum*, Jav.) on growth performance of finishing sheep. A. Estrada-Angulo*, R. Barajas, J. F. Obregon, and F. J. Gallardo, *FMVZ-Universidad Autonoma de Sinaloa, Culiacan-Mazatlan, Mexico*.

With the objective of determining the effect of substitution of sorghum grain with escobero sorghum grain (*Sorghum bicolor*, var. *Technicum*, Jav.) on growth performance of finishing sheep, thirty two hair sheep (males, BW=27.85 kg) were used in a complete randomized block experiment design. The animals were weighed and blocked by weight in groups of four. Groups were placed in eight pens (2 x 3 m) with a bare ground floor, and assigned to consume one of two diets that constituted the treatments: 1) Diet with 15% CP and 3.4 Mcal of DE/kg, containing 60% of Whole sorghum grain, corn straw 10%, SBM 10%, sugar cane molasses 14.5%, and 2.5% of mineral premix (Control); and 2) Diet similar to control, but containing 60% of whole escobero sorghum grain (*Sorghum bicolor*, var. *Technicum*, Jav.), substituting for sorghum grain (ES treatment). Diets were offered twice a day under free access condition. Average daily gain was not affected ($P=0.26$) by treatments (219 vs. 202 g/day for control and ES respectively). Feed intake was increased ($P<0.01$) in 21% for escobero sorghum (1.07 vs. 1.298 kg/day for control and ES respectively). Feed/gain ratio was negatively affected ($P=0.02$) by the inclusion escobero sorghum in the diet (5.11 vs. 6.43 for control and ES respectively). It is concluded, that the inclusion of sorghum bicolor, Var. *Technicum*, Jav, substituting to sorghum grain, decreased growth performance response of finishing sheep.

Key Words: Sorghum Grain, Varieties, Sheep

T249 Effect of substitution of alfalfa hay with Clitoria hay (*Clitoria ternatea* L.) on performance of sheep feed finishing diets. A. Estrada-Angulo*, A. B. Perez-Fernandez, J. F. Obregon, R. Barajas, and E. A. Velazquez, *FMVZ-Universidad Autonoma de Sinaloa, Culiacan-Mazatlan, Mexico*.

To determine the effect of substitution of alfalfa hay with Clitoria hay (*Clitoria ternatea* L.) on performance of sheep fed finishing diets, a 28 day growth performance experiment was conducted. Twenty four Pelibuey sheep (males, initial BW=20.7 kg) were used in a complete randomized Block design experiment. The animals were weighed and grouped by weight. Groups of three were allocated in one of eight pens (2 x 3 m) with a bare ground floor fitted with metal feed bunks (1 x 0.33 m) and waters. The pens were randomly assigned one of two diets that constituted the treatments: 1) Diet with 18.3% of CP and 3.015 Mcal of DE/kg, containing (DM basis), alfalfa hay 50%, (18.01% CP), ground corn 27.8%, soybean meal 9.75%, sugar cane molasses 9.58%, urea 0.57%, limestone 1.15%, and mineral premix 1.15% (control); and 2) Diet same as control, but containing 50% of clitoria hay (19.09% CP), that substituted for all alfalfa hay of the control diet. The animals were weighed at day 1 and 28 of the trial. DM intake was recorded daily. The mean final weight of experiment was 26.9 kg and was not altered ($P=0.48$) by roughage source in diets. Dry matter intake was not affected ($P=0.74$) by treatment with values of 1.009 and 1.014 kg/day for alfalfa and clitoria diets, respectively. Average daily gain was similar ($P=0.20$) for both treatments with means of 0.208 and 0.190 kg/day for alfalfa and clitoria diets, respectively. There were no differences ($P=0.32$) in the dry matter intake/ADG ratio, with values of 4.92 and 5.34 kg/kg for alfalfa hay and clitoria hay diets respectively. It is concluded that clitoria hay can be included up to 50% in the diets of finishing sheep substituting for alfalfa hay without detrimental effect on performance.

Key Words: Clitoria ternatea, Alfalfa Hay, Sheep

T250 Effect of supplementation of meat meals from different non ruminant species on growth performance response in finishing sheep. A. B. Perez-Fernandez, A. Estrada-Angulo*, R. Barajas, and J. F. Obregon, *FMVZ-Universidad Autónoma de Sinaloa, Culiacan-Mazatlan, México*.

To determine the effect of supplementation of meat meals from different non ruminant species on growth performance response in finishing sheep, a 56 days feeding experiment was performed. Eighty Pelibuey sheep (males; BW=23.16 kg) were used in a complete randomized experiment design. Animals were weighed and divided in groups of five.

Groups were placed 16 pens (2x3 m) with a bare ground floor, and randomly assigned to consume one of four diets containing different kind of meat meal that constituted the treatments; protein sources were: 1) Diet with 15% CP and 3.5 Mcal of DE/kg containing Sesame meal as protein supplement (control); 2) Diet containing 6% of fish meal as protein supplement (FM); 3) Diet containing 6% of Pork meat meal (PMM); and 4) Diet with 6% of poultry meal (POM). Diets were offered twice a day (0800 and 1600 h) under free access condition. Pork meat meal reduced ($P<0.01$) feed intake (1.207 vs. 1.100 kg/day for control and PMM respectively), and tended to decreased ($P=0.07$) average daily gain (209 vs. 185 g/day for control and PMM respectively). The treatments did not affected ($P>0.20$) the feed/gain ratio. It is concluded that growth performance of finishing sheep can be altered by the source of meat meal from different nonruminant species.

Key Words: Fish Meal, Pork Meat Meal, Poultry Meal

T251 Comparative effect of tallow and dark poultry fat on apparent digestibility of diets for sheep. A. Estrada-Angulo*, J. C. Robles, J. F. Obregon, and R. Barajas, *FMVZ-Universidad Autonoma de Sinaloa, Culiacan-Mazatlan, Mexico*.

With the objective of comparing the effect of tallow and dark poultry fat on apparent digestibility of diets for sheep, four Pelibuey sheep (males, BW=17.62±0.27 kg) were used in a CrossOver design experiment. The animals were placed in individual metabolic crates (0.6 x 1.2 m), and randomly were assigned to consume one of two diets that constituted the treatments: 1) Diet 15% CP and 3.4 Mcal DE/kg, containing sudan-grass hay, tallow 3%, sorghum grain 45%, sesame meal 15%, sugar cane molasses 12%, and mineral premix 2.5% (Control); and 2) Diet similar to control, but containing 3% of dark poultry fat substituting for the tallow (DPF). Diets were offered twice a day (800 and 1600 h), after a six days of adaptation period, samples of diet (1 kg) and the total of feces produced were collected for four days. Samples were dried, weighed and ground. Treatments did not affected ($P=0.20$) the amount of dry matter (118 vs. 110 g/day for control and DPF respectively) and crude protein (20 vs. 18 g/day for control and DPF respectively) excreted in feces. Apparent digestibility of the diet was similar ($P=0.32$) for both treatments (73.66 vs. 75.28% for control and DPF respectively). Apparent digestibility of crude protein was equal ($P=0.14$) for both treatments (68.43 vs. 72.68% for control and DPF respectively). Digestible Energy content of the diets was not altered ($P=0.30$) by the fat sources. It is concluded, that the dark poultry fat can substituting for tallow in diet for sheep without alter its digestibility.

Key Words: Tallow, Poultry Fat, Sheep

T252 Digestibility of fermented bagasse fed to Suffolk ewes. R. Pradhan*¹, E. Shirakabe¹, T. Nishioka¹, and K. Batajoo², ¹*School of Agriculture, Kyushu Tokai University, Kumamoto, Japan*, ²*Chubu Feed Co. Ltd., Nagoya, Japan*.

Bagasse is a fibrous byproduct remaining after the production of cane sugar. Raw bagasse as such has low feed value and is typically burned at the sugar mill for fuel. Fermented bagasse is produced by fermenting raw bagasse with molasses and special microbial culture mix. In Japan, bagasse is imported from Thailand and is fed as a fiber source to beef cattle, dairy and beef heifers. Field trials indicate that fermented bagasse increases feed intake in beef cattle. Nutrient digestibility and animal performance data of fermented bagasse are limited. Nine mature Suffolk ewes (average age 4.3±0.9 years and body weight 69.4±9.7 kg) were divided into three groups (three animals per group) and fed experimental diet for 8 weeks. Experimental diets (DM basis) were: FB (fermented bagasse 70% + tofu cake mix 30%), FB+TH (35% fermented bagasse + 35% timothy hay + 30% tofu cake mix), TH (70% timothy hay + 30% tofu cake mix). Tofu cake mix consisted of wheat bran 40%, rice bran 5%, tofu cake 10%, barley 10%, corn 15% and beet pulp 20%. Tofu cake mix contained 17% CP, 37% NDF and 36.43% nonfiber carbohydrate (NFC). Total tract digestibility, rumination time, rumen fluid pH, ammonia and VFA were measured during the last week of 8 week period. Fecal and urine sample were collected for 5 days. Rumen DM disappearance at 48 hour (conducted in fistulated dry Holstein cows) were: FB 31.5%, TH 69.1%, and tofu cake mix 87.4%. FB had lower intake, digestibility and N retention compared to TH. FB+TH showed higher intake, nutrient digestibility and similar rumination time relative

to FB. Based on this study fermented bagasse is palatable but not recommended to be fed as a sole forage source. Its inclusion in sheep diet should be less than 35% when fed along with other forages.

		FB	FB + TH	TH
Intake, g/d	DM	1356	1693	1402
Digestibility, %	DM	49 ^a	58 ^b	68 ^c
	CP	66	68	65
	NDF	46 ^a	57 ^{ab}	66 ^b
	ADF	38 ^a	45 ^{ab}	57 ^b
N retention *	Intake	1.14	1.52	1.30
	Fecal	0.39	0.49	0.45
	Urinary	0.54	0.83	0.57
	Retained	0.21	0.20	0.28
Rumen	pH	7.45	7.28	7.21
	Ammonia, mg/dl	12.54	11.39	14.19
Rumination:intake ratio		0.983	1.139	1.444

*gN per kg metabolic body weight;

a,b,c within the same row differ ($P < 0.05$).

Key Words: Fermented Bagasse, Digestibility, Sheep

T253 Chemical diet composition and metabolizable protein intake by grazing sheep. A. S. Juarez-Reyes*, J. Arzola-Nevarez, G. Nevarez-Carrasco, R. Montoya-Escalante, and M. A. Cerrillo-Soto, *Universidad Juarez del Estado de Durango, Mexico*.

The aim of this study was to determine the chemical composition of the diet and the metabolizable protein (MP) intake by sheep grazing a scrubland in North Mexico. Three sheep (52.0 ± 7.2 kg BW) belonging to a herd of 100 animals and fitted with esophageal cannulae were used to collect monthly extrusa samples from August 2002 to May 2003. Animals were sampled two days each month at 1100 and 1530 for 45 minutes. Extrusa samples were analyzed for CP, NDF, ADF, lignin, hemicellulose, cellulose and *in vitro* digestibility with pepsine cellulase. Metabolizable Protein content was performed by the PDI (Intestinal Digestible Protein) model. Dry matter intake was estimated by: total fecal production/1-digestibility. To determine the effective degradability (ED) of CP, 5 g DM samples were incubated in nylon bags for 0, 3, 7, 12, 24, 48, 72 and 96 h, in 3 rams fed alfalfa and concentrate (70:30). The CP degradation was established by: $p = a + b(1 - e^{-ct})$, where p is CP disappearance from the bags, a the soluble fraction, b the insoluble but potentially degradable fraction, c the base of natural logarithm, t the rate of degradation of b and t the period of incubation. The data were analyzed using a completely randomized design. Mean DM intake was 1 kg/d. Chemical composition was different ($P < 0.05$) between months. Mean values of CP, NDF, ADF, lignin, hemicellulose, cellulose and *in vitro* digestibility contents were 176, 542, 369, 141, 190, 228 and 556 g/kg DM, respectively. The mean ED value was 70.8% with a range from 60.4 to 93.7% ($P < 0.05$). Microbial protein (Mp) derived from dietary nitrogen (MpN: 77 g/kg organic matter fermented in the rumen (OMFR)) was higher ($P < 0.05$) than that derived from dietary energy (MpE: 36 g/kg OMFR). Thus, the energy consumption was the limiting factor to microbial growth. The mean value of MP intake for pregnancy was 69 g/d (MpE: 36 g/kg + bypass protein: 33 g/d). Metabolizable protein requirements for maintenance (50 g/d) and late pregnancy (67 g/d) were satisfied but not the lactation requirements (115 g/d). Under the conditions of this study, to increase the utilization of degradable protein and thus, the MP consumption, an energy degradable supplement may be necessary.

Key Words: Sheep, Grazing, Metabolizable Protein

T254 Effect of chromium methionine supplementation on growth performance and carcass traits of hair sheep. F. Juarez*, R. Barajas, M. A. Espino, J. F. Obregon, and F. G. Rios, *FMVZ-Universidad Autonoma de Sinaloa, Culiacan-Mazatlan, Mexico*.

With the objective of determining the effect of inclusion of 0.0, 0.4 and 0.8 ppm of chromium (from chromium methionine) in the diet on growth performance of hair sheep, sixty hair sheep (Males; BW= 17.3 kg) were used in a complete randomized block experiment design. The animals were weighed and blocked by weight in group of five. Groups were placed in twelve pens with earth floor (2 x 3m), and assigned to consume one

of three diets that constituted the treatments: 1) Diet with 14.1% CP and 3.0 Mcal of DE/kg, containing corn straw 15%, corn grain 55.0%, soybean meal 15.5%, sugar cane molasses 12% and mineral premix 2.5% (Control); 2) Diet similar to control but containing 0.4 ppm of Cr; and 3) Diet similar to control but containing 0.8 ppm of Cr. Animals were weighed on days 1, 28, and 56. Feed was offered twice a day under free access condition. Treatments did not affect ($P > 0.30$) end weight (29.16, 30.57, and 30.10 kg for 0, 0.4, and 0.8 ppm Cr respectively), feed intake (0.898, 0.910, and 0.902 kg of DM/day for 0, 0.4, and 0.8 ppm Cr respectively), average daily gain (0.211, 0.236 and 0.229 kg/day for 0, 0.4, and 0.8 ppm Cr respectively) or feed/gain (4.302, 3.891 and 3.962 for 0.0, 0.4 and 0.8 ppm Cr respectively). Hot carcass weight, carcass yield, rib eye area, and back fat were not affected ($P > 0.10$) by treatments. It is concluded, that the inclusion of 0.4, and 0.8 ppm of chromium methionine in the diet, does not affect growth performance and carcass traits of hair sheep.

Key Words: Chromium Methionine, Growth-Performance, Sheep

T255 Effect of chromium methionine supplementation on serum concentration of triglycerides and cholesterol of fattening sheep. F. Juarez*, M. A. Espino, and R. Barajas, *FMVZ-Universidad Autonoma de Sinaloa, Culiacan-Mazatlan, Mexico*.

With the objective of determining the effect of chromium methionine supplementation on serum concentration of triglycerides and cholesterol of fattening sheep, twelve Pelibuey Tabasco sheep (Males 15.46 ± 0.45 kg) were used in a complete randomized experiment design. Animals were placed in individual metabolic crates, and were randomly assigned to consume one of three diets that constituted the treatments: 1) Diet with 14.1% CP and 3.0 Mcal of DE/kg, containing corn straw 15%, corn grain 55.0%, soybeans meal 15.5%, sugarcane molasses 12%, and mineral premix 2.5% (Control); 2) Diet similar to control but containing 0.4 ppm of Cr; and 3) Diet similar to control but containing 0.8 ppm of Cr. Blood samples were collected from the jugular vein on days 1, 14, 28, 42, and 56, serum was obtained by centrifugation, and triglycerides and cholesterol analyses were performed by spectrophotometric methods. On day 14, 0.4 ppm Cr increased ($P < 0.01$) serum triglycerides level (20.5 vs. 20.7 mg/dL for control and 0.4 ppm Cr respectively), Cr 0.8 ppm had not effect ($P > 0.20$) relative to control, a quadratic effect of Cr ($P < 0.01$) was observed. On day 28, 0.4 ppm Cr decreased ($P = 0.04$) serum triglycerides (32.0 vs. 24.5 mg/dL for control and 0.4 ppm Cr respectively). Across all timepoints 0.8 ppm Cr decreased ($P = 0.07$) triglycerides serum levels (28.9 vs. 23.9 mg/dL for control and 0.8 ppm Cr respectively). Cr supplementation linearly decreased ($P = 0.09$) cholesterol on day 14 (47.5, 42.5, and 38.0 mg/dL for control, 0.4 ppm Cr, and 0.8 ppm Cr respectively). It is concluded that, chromium methionine supplementation reduced serum triglycerides concentration, and its impact on serum cholesterol level is only observed during the start of the feeding period in sheep.

Key Words: Triglycerides, Serum Cholesterol, Sheep

T256 Effect of substitution of canola meal with overcooked sesame meal on growth performance of hair sheep. J. F. Obregon*, A. Estrada-Angulo, and R. Barajas, *FMVZ-Universidad Autónoma de Sinaloa, Culiacan-Mazatlan, Mexico*.

With the objective of determining the effect of substitution of canola meal with overcooked sesame meal on growth performance in hair sheep during the finishing phase, thirty two hair sheep (males; BW=26.23 kg) were used in a complete randomized block experiment design. The animals were weighed and blocked by weight in groups of four. Groups were placed in eight pens (2 x 3 m) with a bare ground floor and assigned to consume one of two diets which constituted the treatments: 1) Diet with 15.97% CP and 3.31 Mcal of DE/kg, containing (DM) Sudan grass hay 20%, corn grain 49%, canola meal 20%, sugarcane molasses 8.4%, and mineral premix 2.6% (control); and 2) Diet similar to control, but containing 20% of sesame meal substituting for the canola meal. Animals were weighed on day 1 and day 28 at which time the trial was completed; feed was offered twice a day under free access condition. Treatments did not affect ($P > 0.2$) end weight (32.75 vs. 32.54 kg), feed intake (1.115 vs. 1.288 kg of dry matter/day), average daily gain (0.234 vs. 0.225 kg/day) or feed/gain (4.76 vs. 5.72) for canola meal and sesame meal

respectively. It is concluded, that overcooked sesame meal can be included in diets for finishing sheep, substituting for canola meal without altering performance in hair sheep in the finishing phase.

Key Words: Sesame Meal, Canola Meal, Hair Sheep

T257 Ruminal degradation of dry matter of raw cull chop suey beans (*Vigna radiata* L., Wilzeck) in sheep. J.F. Obregon*, J.C. Robles, R. Barajas, A. Estrada-Angulo, and M. Valdez, *FMVZ-Universidad Autonoma de Sinaloa (Mexico)*.

This study was designed to determine the ruminal degradation of dry matter (DM) of raw cull chop suey beans (*Vigna radiata* L., Wilzeck) in sheep. Two Pelibuey sheep (31.5 kg) fitted with ruminal cannulas were used. The animals were fed with a diet 25:75 roughage:concentrate, containing 20% of raw cull chop suey beans. Nylon bags (10 x 18 cm) containing 5 g of raw cull chop suey beans (CCB) or soybean meal (SBM) were randomly designated to be incubated in rumen of sheep for 3, 6, 9, 12, 18, 24, and 36 hours. After the incubation was completed, the bags were washed with tap water and DM was determined. DM degradability at 3 hours was similar ($P=0.19$) for SBM and CCB (39% vs. 42.82%, respectively), the ruminal degradation of CCB-DM was greater than SBM-DM ($P<0.02$) at 18 hours incubation time (92.87 vs. 83.02%, respectively). After 36 hours of rumen incubation, there were no differences ($P>0.63$) between CCB-DM and SBM-DM degradation (95.32 vs. 93.75%, respectively). Soluble fraction (a), degradable fraction (b) and rate of degradation (c) of CCB-DM were 25.58%, 70.95%, and 0.134%/hour, respectively. While values of 27.68%, 77.09%, and 0.076%/hour for fraction a, b, and c, respectively, were obtained for SB-DM. The effective dry matter of CCB degraded in rumen was calculated in 87.03%. It is concluded that dry matter of raw cull chop suey beans is highly degradable and rapid degraded in rumen of sheep.

Key Words: Chop Suey Beans, Rumen Degradability, Sheep

T258 Ruminant degradation of dry matter of overcooked sesame meal using nylon bag technique in sheep. J. F. Obregon*, H. Castro, R. Barajas, A. Estrada-Angulo, G. Telles, and Y. Peraza, *FMVZ-Universidad Autonoma de Sinaloa, Culiacan-Mazatlan, Mexico*.

The nylon bag technique was used to determine the ruminal degradation of sesame meal dry matter in sheep. Three sheep (Pelibuey males, BW=32 kg) were fitted with rumen cannula. The animals were fed a diet containing corn straw 13%, corn grain 55.5%, soybean meal 20%, sugar cane molasses 9%, and mineral premix 2.5% (16.5% CP and 3.55 Mcal DE/kg). Nylon bags (10x18 cm) containing 5 g of sesame meal (SM) or soybean meal (SBM) were randomly designated to be incubated in rumen of sheep for 3, 6, 9, 12, 18, 24, 36, or 48 hours. After removal from the rumen the bags were washed with tap water and DM was determined. The DM disappearance from nylon bags was higher ($P<0.01$) for soybean meal than sesame meal for all times of incubation, DM degradability was 35.05% vs. 30% at 3 hours, 67.8% vs. 46.05% at 12 hours, 87.36% vs. 53.05% at 24 hours and 97.4% vs. 63.9% at 48 hours for soybean meal and sesame meal respectively. Soluble fraction (a), degradable fraction (b) and rate of degradation (c) were 25.46%, 40.70% and 0.054%/h for SM, respectively. While values of 19.37%, 82.47%, and 0.067%/h for fraction a, b, and c, respectively, were obtained for SBM. The effective dry matter of SM degraded in rumen was calculated in 55.7%. It is concluded that dry matter of sesame meal is less degradable by and more slowly degraded in the rumen of sheep.

Key Words: Sesame Meal, Rumen Degradability, Sheep

T259 Genetic resistance to *Eimeria* infections in Merinoland sheep and relationships among oocyst count, *E. ovinoidalis* antibody level and live weight. M. Gauly*¹, J. Reeg², C. Bauer³, H. Brandt², C. Mertens⁴, H. Zahner³, and G. Erhardt², ¹*Institute of Animal Breeding and Genetics, University of Göttingen, Göttingen, Germany*, ²*Department of Animal Breeding and Genetics, University of Giessen, Giessen, Germany*, ³*Institute of Parasitology, University of Giessen, Giessen, Germany*, ⁴*Intervet Innovation GmbH Zur Propstei, Schwabenheim, Germany*.

Genetic parameters in resistance to *Eimeria* infections were studied in Merinoland sheep lambs ($n = 222$) descending from 179 ewes and sired by 10 rams, using *Eimeria* oocyst counts (oocysts per gram of faeces,

OpG) and *E. ovinoidalis* antibody level index (Ab) as marker traits. Faecal samples were taken individually in all lambs beginning at an age of 17 until an age of 40 days every third and afterwards every sixth day, respectively. The presence and number of oocysts were determined (OpG) using the modified McMaster method with saturated NaCl as the flotation fluid, which allowed the detection of a minimum of 100 OpG (MAFF, 1986). Blood samples were taken from all lambs at an age of 7, 40 and 80 days to measure antibody level using a Sandwich-ELISA (Nolan et al., 1986). Based on that Ab was calculated (Zahner et al., 1981). All lambs were individually weighed at birth and at 21, 40, 80, 120 and 150 days of age. Male lambs were slaughtered with a weight of 42 kg and females with 39 kg. OpG and Ab were transformed as the decimal logarithm or logarithm to correct for heterogeneity of variance and to produce approximately normally distributed data. 1714 samples (33.6 %) were oocyst negative while 3392 samples (66.4 %) were positive. Every lamb shed at least once oocysts. Even animals with high oocyst counts did not show any visible signs of sickness. Heritabilities of decimal log OpG were between 0.00 and 0.79 (s.e. 0.27). Mean log Ab was decreasing from a level of 0.33 (s.d. 0.13) at day 7 to a level of 0.13 (s.d. 0.07) at day 40 before the value increased again to 0.25 (s.d. 0.13) at day 80, respectively. The estimated heritabilities for log Ab measured at days 7, 40 and 80 were between 0.00 and 0.02 (s.e. 0.06), respectively. Phenotypic correlations among log OpG and body weight ranged between $r = -0.07$ ($p > 0.05$) and $r = -0.25$ ($p < 0.01$), respectively. The corresponding correlations between log Ab at various ages and body weight averaged between $r = -0.09$ ($p > 0.05$) and $r = 0.27$ ($p < 0.05$), respectively

Key Words: *Eimeria* Resistance, Antibody Level, Oocyst

T260 Phenotypic correlations between body measurements and production performance of six sheep breeds at north-central México: exploratory trial. M. A. Gallegos-Acevedo, N. Nieves-Herrera, C. F. Arechiga, J. I. Aguilera, M. A. Castillo-Pecina, and M. A. Lopez-Carlos*, *Universidad Autonoma de Zacatecas, Zacatecas, Mexico*.

Body measurements of 72 young rams (4 to 6 months of age) of different breeds (Rambouillet $n=17$, Suffolk $n=5$, Blackbelly $n=8$, Dorper $n=8$, Kathadin $n=21$ and Pelibuey $n=14$) were correlated with their production performance. Seventeen parameters, scrotal circumference (SC), body weight (BW), body length (BL), shoulder height (SH), shoulder width (SW), hindquarter height (HH), hindquarter width (HW), heart girth (HG), abdominal girth (AG), metacarpus circumference (MCC), metatarsus circumference (MTC), knee circumference (KC), neck circumference (NC), shoulder width (SW), wide of the back (WB), average daily gain (ADG) and feed conversion (FC) were measured 90 days apart (two times during the trial), as an exploratory test to develop a simple "on farm" ram selection method, and selection indexes for these breeds on local production conditions. Highest phenotypic correlations of 0.90 - 0.91 were found between BW and HG, for all breeds except for Dorper where a correlation of 0.34 was found. Some authors have found high relations between BW and BL, but in this trial medium values were obtained (0.45 - 0.62). Correlations between BW, HH, NC, KC and WB obtained high values (0.72 - 0.85). The measurements of the bone mass, MCC and the MTC, obtained high values of correlation (0.75 - 0.82) with BW, HG and AG. SC had low (0.20) to medium (0.40 - 0.50) correlations with other parameters measured. ADG obtain intermediate correlations with bone measurements MCC and MTC (0.45 - 0.53) and FC a low relationship (-0.02-0.015) with all parameters measured except with BW (0.73). Different correlation values were found for different breeds included in this trial, demonstrating that these measurements are related to the breed body shape and size. This exploratory trial could help us to develop a simple "on farm" method for selection of rams.

Key Words: Sheep, Phenotype, Genetic Traits

T261 Effect of breed type, finishing treatment, and dietary supplements on carcass characteristics and tenderness in hair sheep. M. Fisher¹, S. Duckett*¹, and S. Wildeus², ¹*The University of Georgia, Athens*, ²*Virginia State University, Petersburg*.

Thirty-six lambs were used to determine the effects of breed, finishing diet, and CP level of supplement on carcass quality and tenderness. Lambs from three hair sheep breeds (Barbados Blackbelly [BB];

Katahdin [K]; and St. Croix [STX]) were assigned to two finishing diets (pen [PEN] vs. pasture [PAST]) and supplemented with 12% (LOW) or 18% (HIGH) CP. Lambs finished in PEN received chopped, moderate quality grass hay; whereas lambs finished on PAST were allowed to graze native, predominantly fescue pasture. Lambs were harvested, and carcass data and loin samples collected at 24 h postmortem. Loin were aged at 4°C for 14 d and frozen for subsequent Warner-Bratzler shear force (WBS) measurement. Data were analyzed as a 3 x 2 x 2 factorial design to evaluate the effects of breed, finishing diet, supplemental CP level, and all possible interactions. Hot carcass weight (HCW) and ribeye area (REA) were greater ($P < 0.05$) for K than BB or STX. Carcasses from STX had heavier ($P < 0.05$) HCW but smaller ($P < 0.05$) REA than BB. Flank streaking was greater ($P < 0.05$) for K and STX than BB. Leg scores and quality grades were greater ($P < 0.05$) for K than BB or STX, which were similar. Body wall thickness was greater ($P < 0.05$) for K and STX than BB. The three-way interaction between breed, finishing diet and CP supplementation was significant ($P < 0.05$) for fat thickness. Fat thickness was higher ($P < 0.05$) for K fed HIGH on PAST than K-PAST-LOW, K-PEN, or STX and BB regardless of finishing diet and CP level. Fat thickness was lower ($P < 0.05$) for BB fed HIGH on PAST than K-PAST regardless of CP level or K-PEN-LOW. For WBS, HIGH increased ($P < 0.10$) WBS in BB but CP supplementation level did not alter WBS for STX or K. Hair sheep breed influenced carcass quality with K having heavier HCW and greater quality grades. Finishing diet and CP supplementation only influenced fat thickness levels but did not alter other carcass variables.

Key Words: Lamb, Hair sheep, Tenderness

T262 Characterizing exfoliative vaginal cytology (ECV) in ewes from 60 d of age through parturition. G. Solis, J. I. Aguilera, R. M. Rincon, R. Bañuelos, and C. F. Arechiga*, *Universidad Autonoma de Zacatecas, Zacatecas, Mexico.*

Present work try to characterize exfoliative vaginal cytology (EVC) from 60 d of age through parturition of Border-Leicester X Rambouillet lamb ewes from Mexican highlands of Zacatecas (22° 58' of north latitude and 102° 31' of west latitude above 2,153 m above the sea level). Vaginal smears (n=967), were obtained from ewes (n=8), from d 60 of age until parturition through different developmental stages: Pre-puberty, Puberty, Estrous Cyclicity, Pregnancy, Parturition. Papanicolau staining was performed to identify cellular types on vaginal smears. During the Pre-pubertal stage of ewe lambs (n=541 smears), basal (B) cells were mainly predominant followed by intermediate (I) and superficial (S) cells (B=84.62%; I=14.52%; S=0.41%). At the beginning of Puberty (n=8 smears), superficial cells were mainly predominant (B=1%; I=4%; S=84%), however, during the Estrous Cyclicity stage, (n=263), intermediate cells predominate with considerable populations of basal and superficial cells (B=23.1%; I=49.9%; S=26.62%). During Pregnancy (n=148 smears), there was an increase of intermediate cells (B=8.77%;

I=77.57%; S=11.95%). At Parturition (n=7), there was tendency to decrease intermediate cells and increase superficial cells (B=19%; I=38%; S=38.86%). Thus, we can conclude that in the Pre-pubertal stage there is a high population of basal cells. At the beginning of Puberty, there is high proportion of superficial cells (estrogen influence). During Estrous cyclicity there is a double amount of intermediate cells in comparison with basal and superficial cells (progesterone dominance). During Pregnancy, there is a high dominance of intermediate cells (high progesterone influence) and finally, at Parturition, there is a tendency to decrease intermediate cells (decreased progesterone) and to increase superficial cells (increased estrogens), until both cell types reach similar ratios.

Key Words: Ewe, Cytology, Vaginal Smears

T263 Sexual behavior and interaction of hair rams as an auxiliary aid for estrus detection in bovine females. C. F. Arechiga*, M. G. Magallanes¹, N. Nazarala¹, R. M. Rincon¹, J. A. Piña¹, M. A. Lopez¹, and J. Valencia², ¹*Universidad Autonoma de Zacatecas, Zacatecas, Mexico,* ²*Universidad Nacional Autonoma de Mexico, Mexico.*

Sexual behavior of hair rams (Black-belly, n=2) expressed by interaction with bovine females was evaluated as a possible auxiliary for visual estrus detection of cows included in artificial insemination programs. Bovine females (n=8), were dairy cows (n=3) and beef heifers (n=5). Sexual behavior of hair rams was evaluated on response to bovine-ovine interaction, to be used as ovine-teasers on estrus detection of bovine females, based on a previous adaptation period of 120 d. Then, bovine females were induced in estrus by a prostaglandin injection. 56 h post-administration of prostaglandins, hair rams were introduced into a pen with bovine females. Sexual behavior and interactions were recorded among both species by video-camera films. 100% of bovine females (8/8) were induced in estrus by 72.84 ± 5.12 h after prostaglandin injection. Estrus duration was 11.91 ± 5.64, bovine females performed 77 mounts, received 74 mounts, showed 12 anxiety signs and 6 cases of presence of vaginal mucus. In contrast, 42.9% of females (3 of 7), showed natural estrus 20.6 d after induced estrus. Performing 45 mounts, receiving 30 mounts, and 2 cases of presence of mucus without showing anxiety signs. Sexual behavior of hair rams in both types of estrus was: 20 courtships, 13 followings, 9 sniffings, 5 Flehmen reflexes, 3 territory markings, 2 masturbations and 2 homosexual mounts within male rams (adult and young rams). In conclusion, a hair ram is capable of showing sexual interest to bovine females in estrus. Such type of behavior, could help to visually detect bovine females in early estrus, independently of age (cows and heifers) or type (dairy and beef). Sexual behavior of rams seems to be acquired by a previous adaptation period of 120 d of interaction with bovine females.

Key Words: Estrus Detection, Sexual Behavior, Hair Sheep

Extension Education

T264 Financial performance of dairies in Florida and Georgia in 2002. A. deVries¹, R. Giesy¹, L. O. Ely*², A. deAraujo¹, A. Andreasen¹, B. Broadus¹, S. Eubanks¹, D. Mayo¹, P. Miller¹, T. Seawright¹, and C. Vann¹, ¹*University of Florida, Gainesville,* ²*University of Georgia, Athens.*

The Dairy Business Analysis Project (DBAP) includes an annual survey of the financial performance of dairies primarily located in Florida and Georgia. Its objective is to document the dairies financial success using standardized, accrual accounting methods in order to calculate benchmarks and provide feedback on the dairies financial strengths and weaknesses. Twenty-nine dairies submitted financial data in 2002. Twenty-seven dairies were included in the summary results. Of these, 18 were located in Florida, 8 in Georgia and one in Alabama. The average herd size was 1,168 cows and 583 heifers with 16,810 lbs. milk sold per cow. The average culling rate was 34%. There was an average of 20 FTE workers per farm and 1,010,000 lbs milk sold per FTE worker. Total revenue per cwt. was \$17.67 / cwt with \$16.05 / cwt milk income. The average total expense was \$17.88 / cwt. The largest expense items were purchased feed (\$7.00 / cwt), labor (\$2.88 / cwt), and livestock (\$1.04 / cwt). Net farm income from operations was on average \$-.21 / cwt and net farm income was \$-.10 / cwt. The debt to equity ratio was 1.10, the rate of return on assets was -0.02, the rate of return on equity

was -0.08, the operating profit margin was ratio was -0.03. There was no clear association between income, expenses or returns with herd size in 2002. Milk price / cwt was lowest for <500 cows (\$15.81) but other income was highest (42.25 / cwt) resulting in the highest total income (\$19.24 / cwt) and net farm income \$0.57 / cwt. Milk price, total income, total expenses increased with production level. net farm income was highest for medium production level.

Key Words: Dairy, Financial, Management

T265 Factors affecting death losses in DHI holstein herds. L. O. Ely* and J. W. Smith, *University of Georgia, Athens.*

Dairy cow death losses are a significant economic loss for U. S. dairy farmers. This study examines the effect of several factors (yr, region, month of the yr, herd milk production level, and herd size) and the interaction of these factors on death losses in DHI Holstein herds. DHI herd summary records for the years 1999 through 2002 were sorted and classified by yr, region (Northeast, Midwest, Midsouth, South), month, milk production level (low[5443 to 7258 kg], medium [7258 to 9072] and high [>9072]), and herd size (small[<100 cows], low medium [100 to 149], high medium [150 to 299] and large [>300]). Monthly death loss