

ppm and decreased at 24 ppm in L2. First service conception rate was significantly lower for the 24 ppm group compared to control during L1 but not during L2. As a result, days open during L1 and calving interval were longer for the 24 ppm group than control. Female calves from monensin treated cows weighed more at birth than controls, but birth weights of male calves were not different. There was no difference in calving difficulty between treatment groups. Average daily gain of female calves to 28 d of age was not different between groups. Monensin did not affect multiple birth rate or calf gender ratio.

Parameter	Lactation	Monensin			
		0 ppm	8 ppm	16 ppm	24 ppm
Number of cows (9 sites) 50-200					
DIM	L1	218	211	219	221
Inseminated	L1	213	209	213	216
Conceived	L1	181	177	170	179
Calved	L1	160	155	149	164
(3 sites) 50-200					
DIM	L2	60	61	55	60
Inseminated	L2	58	56	54	59
Conceived	L2	48	47	44	46
Days to 1st service					
	L1	84.1	84.7	86.9	83.6
	L2 ^a	89.7	97.5	89.0	83.1
1st service conception rate	L1 [#]	0.499	0.427	0.448	0.378*
	L2	0.439	0.560	0.366	0.424
Overall conception rate	L1	0.431	0.415	0.404	0.379
	L2	0.435	0.458	0.352	0.326
Days open					
	L1	99.8	104.6	100.4	107.7*
	L2	102.0	101.4	111.3	105.8
Calving interval, days [#]					
		380.8	383.6	381.8	389.6*
Female calf wt, kg [#]					
		40.8	43.0*	42.8*	43.5*
Male calf wt, kg					
		45.6	46.9	46.2	45.9

1031 Carcass composition and meat quality from New Zealand, California, Chinchilla and Rex rabbits. A. Ortiz and M. S. Rubio*, *Facultad de Medicina Veterinaria y Zootecnia, Universidad Nacional Autonoma de Mexico, Mexico.*

The objective of this study was to determine the differences on dressing percentage, carcass composition and meat quality from four rabbit breeds. Forty rabbits, 10 New Zealand (NZ), 10 California (CA), 10 Chinchilla (CH) and 10 Rex (RX), from both sexes were used. Animals were fed commercial diets until reaching an average weight of 2 kg at the time of slaughter. Dissection was carried out on the left half of the carcass to obtain the main tissues percentages (bone, muscle, internal, intermuscular and subcutaneous fat and other tissues). Muscles from the right legs were used to determine chemical composition of the meat. The loin muscles from the right half carcasses were used to run Warner-Bratzler shear force test. Left side legs were cooked and a consumer sensory panel using 85 people was carried out on different Mexican regional markets. Results were analyzed using a descriptive analysis and breed and sex were the independent variables. Dressing percentage was no different among breeds. NZ carcasses had the higher loss for overnight cooling. Dissection showed that RX had the lowest percentage of bone (16.44±2.45) and the highest percentage of internal fat (2.53±0.56) compared to NZ that had the highest (19.64±1.18) and the lowest (17.04±0.95), respectively. No differences were found with respect to muscle percentage among breeds. Shear force results were similar for the four types of rabbit meat. Chemical composition of the loin muscles showed no differences among breeds. Consumer sensory panel showed that meat from CH animals had the best aroma (5.14±1.19) compared to that from NZ (4.75±1.00). Meat from RX animals resulted in the most tender compared to CA meat (5.38±1.00 and 4.85±1.30, respectively). These results suggest that meaty rabbits (CA & NZ) are

*P<0.1 vs control, ^aP<0.1 treatment χ^2 test, [#]P<0.1 linear trend

Key Words: Monensin, Reproduction

1030 Management tools for assessing passive immunity transfer in dairy calves. K.M. Kouri*, D.D. LaCoss, D.E. Watkin, J.W. Barlow, and J.R. Knapp, *University of Vermont, Burlington, VT.*

Twenty-three Holstein and Jersey calves were used to evaluate effects of colostrum management and to evaluate three methods of determining adequate passive immunity transfer. Calves were fed 2L of colostrum at birth and another 2L at 12h post-partum (pp). Blood was sampled before colostrum feeding and at 6 and 24h pp and serum collected. Serum was immediately tested for total serum protein using a refractometer and for serum IgG using the Midlands Bioproducts Quick Test. Serum and colostrum were stored and assayed later using a radioimmunoassay (RID) kit from VMRD, Inc. Differences in serum IgG as determined by refractometer and RID were tested using the SAS-GLM procedure. The validity of the Quick Test was compared using the serum IgG values determined by RID. The refractometer results differed from RID results 7.3% of the time, while the Quick Test differed from the RID 9.7% of the time. Regression equations were developed between total serum protein measured by the refractometer and IgG levels measured by RID at both 6 and 24h pp. The equations agree with previously published equations for serum IgG at 24h pp. As expected, significant differences were found between pre-feeding and post feeding IgG levels (p<.01). Differences (p<.01) were also observed between IgG levels at 6 and 24h pp, with levels increasing over time. This would suggest that the second feeding of 2L colostrum at 12h pp significantly increased the probability that passive transfer occurred by 24h pp. Adequate passive transfer (serum IgG \geq 10 mg/dl) was achieved in 20 of the 23 calves. In summary, the Quick Test and refractometer are both valuable tools for assessing a calf's IgG status in the first 24 hours after birth. Beyond the use of these tools, passive transfer in neonatal dairy calves can be most easily achieved with a well planned and implemented colostrum feeding protocol based on the use of high quality colostrum.

Key Words: Colostrum, Immunoglobulin G, Calf Nutrition

RABBIT SPECIES

leaner and have less aroma and tenderness than the pelt (CH & RX) rabbits.

Key Words: Rabbits, Carcass composition, Meat, Sensory

1032 Effect of supplementation with animal plasma and antibiotics of starter diets in rabbits. I. Gutierrez¹, P. Cachaldora², R. Carabaño¹, P. Medel^{*1}, and C. de Blas¹, ¹*Departamento de Produccion Animal, E.T.S.I. Agramonos,* ²*COREN, S.C.L.*

This study evaluated the inclusion of animal plasma (Appetein[®]) and antibiotics (a mixture of 100 ppm Bacitracine and 60 ppm of Apramidine) in diets for early-weaned rabbits (25 d of age). Two feeding trials using 280 individually- and 420 collectively-caged (groups of four) animals, and a digestibility trial using 66 animals in metabolism cages, were conducted. Six diets were formulated using a factorial arrangement with three levels of animal plasma (0, 2, and 4%) and supplementing with or without antibiotics. Inclusion of animal plasma was made on an iso-nutritive basis, by substituting an increasing amount of soybean meal with a mixture of animal plasma and sugar beet pulp. The experimental diets were fed in the first two-weeks after weaning. After that, all the animals received a common commercial fattening feed. The type of diet did not affect DM or CP digestibility, which averaged 62.3 and 77.7%, respectively. Both animal plasma and antibiotic inclusion improved growth performance, but the response was more apparent at earlier ages and when environmental conditions were poorer. In these conditions, inclusion of a 4% of animal plasma increased feed intake (67.4 vs 72.8 g/d, P < .05) and weight gain (35.8 vs 38.4 g/d, P < .05), but feed efficiency was not affected. However, no significant effects of dietary treatments were found for the whole fattening period. Antibiotic supplementation had a similar effect as animal plasma on growth traits in young animals, and furthermore was effective (but not animal

plasma addition) in reducing mortality caused by epizootic rabbit enteritis. From this study it can be concluded that animal plasma is a highly palatable and digestible source of protein for early-weaned rabbits. Based on our results, the positive response to animal plasma may depend on the age, the environmental conditions and the health status of the animals.

Key Words: Animal Plasma, Antibiotics, Early Weaned Rabbits

1033 Bovine follicular fluids modulate the release of transaminases, acrosome reaction and motility of rabbit sperm. M.M. Zeitoun*, *Faculty of Agriculture, Alexandria University, Egypt.*

This study investigates the effect of supplementing bovine follicular fluids (FF) to rabbit sperm motility, acrosome reaction and transaminases activities. Ovarian FF were collected from 46 pairs of bovine ovaries. Normal follicles were classified, according to their diameters, into small (SFF, ≤ 4 mm), medium (MFF, $>4-8$ mm), large (LFF, > 8 mm) and cystic (CSTFF, >20 mm). Rabbit semen was collected and diluted with EBSS-P medium and incubated in a CO₂ incubator at 37 °C. Two levels (20 and 40%) of FF were tested. Sperm motility index (SMI), percent acrosome reaction (%AR) and the activity of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) in the extracellular

media were determined. Sperm motility was decreased by FF addition ($P<0.01$). As the diameter of follicle increased the reduction in motility decreased ($P<0.01$). On the other hand, the cystic FF caused the highest reduction in sperm motility. As time of incubation progressed a sharp decline was observed ($P<0.01$) in sperm motility. Addition of FF increased ($P<0.01$) the reacted acrosome (16.7, 16.3, 17.1, 20.1 and 13.1% for , large , medium , small, cystic FF and control, respectively). A linear increase ($P<0.01$) of acrosome reaction was obtained as incubation time advanced (13.3, 15.3, 17.2 and 22.1 % at 0, 1, 2 and 4 hr, respectively). The release of AST and ALT significantly ($P<0.01$) increased by FF treatment and time progression. As the FF level increased the activity of ALT increased ($P<0.01$). In all cases, the addition of FF increased the release of ALT greater than in the control, however in the case of AST, large FF did not change its release compared to the control. Cystic FF always increased both enzyme activities. There was a positive correlation coefficient between ALT activity and percent of reacted acrosome. On the other hand, a significant negative correlation coefficient was found between sperm motility and acrosome reaction. In summary, bovine FF modulates rabbit sperm characteristics.

Key Words: Bovine Follicular Fluids, Rabbit Sperm, AST, ALT

RUMINANT NUTRITION

1034 Ionophores for dairy cattle: current status and future outlook. R. K. McGuffey*, L. F. Richardson, and J. I. D. Wilkinson, *Elanco Animal Health, Greenfield, IN.*

Ionophores are used commercially throughout the world in the beef and poultry industries. Production efficiency of cattle is increased through alteration of rumen fermentation and control of protozoa that cause coccidiosis. Ionophores act by interrupting transmembrane movement and intracellular equilibrium of ions in certain classes of bacteria and protozoa that inhabit the gastrointestinal tract. The actions of ionophores provide a competitive advantage for certain microbes at the expense of others. In general, metabolism of the selected microorganisms favors the host animal. Energy metabolism is enhanced through increased production of propionate among ruminal fatty acids with a concomitant reduction in methane. Ruminal degradation of peptides and amino acids is reduced thereby increasing the flow of protein of dietary origin to the small intestine. Total flow of protein to the lower tract is often increased with ionophore feeding. Risk of digestive disorders such as bloat and acidosis that result from abnormal rumen fermentation is reduced as are certain conditions caused by toxic products of fermentation, e.g., 3-methyl indole. Dry matter and nitrogen digestibilities are increased with ionophores thereby providing environmental benefits. Monensin and lasalocid have been the most studied in research demonstrating benefits to the dairy cow. Ionophores enhance the glucose status of dairy cows through increased production of propionate. Many of the demonstrated benefits of ionophores are associated with enhancement of the energy status of the cow in the transition period and during early lactation. The benefits include less mobilization of body fat as evidenced by reduced blood nonesterified fatty acids and ketones and increased glucose. Animal manifestations include lower incidence of ketosis and displaced abomasum, reduced loss of body condition, increased milk production and improved milk production efficiency.

Key Words: Ionophore, Dairy Cows, Lactation

1035 Milk production of Holstein x Sahiwal cows receiving monensin and a sustained release formulation of methionyl bovine somatotropin. T. P. Pelaez¹, I. A. Duque¹, D. Zambrano¹, E. Plaza², V. A. Reyes², N. S. Defaz², C. Gonzalez³, E. Bernal³, and R. K. McGuffey³, ¹Universidad Estatal de Quevedo, Quevedo, Ecuador, ²Rey Sahiwal, Grupo Wong, Guayaquil, Ecuador, ³Elanco Animal Health, Bogota, Colombia.

Monensin (M) in a dairy concentrate (0 or 100 g/ton) and bovine somatotropin (bST) (500 mg/14 days) were administered in a 2 X 2 arrangement of treatments to 112 Holstein X Sahiwal lactating cows for 112 days to determine effects on milk yield and bodyweight. Cows averaged 80.3 days in milk at the beginning of treatments. Cows grazed on pastures of African stargrass (*Cynodon nlemfuensis*) and guinea grass (*Panicum*

maximum). They were fed the medicated concentrate at milking followed by an offering of waste bananas (*Musa sp*) after milking during the experiment. Results are shown in the table. Milk production was increased by M and bST. Weight gain favored cows receiving M and bST.

Item	Control	Mon(M)	bST	M+bST
Conc,kg/d	2.23	2.15	2.44	2.33
Milk,l/d				
Pretrt (P)	13.7	12.8	13.3	13.8
Trt (T)	10.1	10.2	11.2	12.0
T/P (%)	73.5	79.7	83.9	86.7
Bwt, kg				
Start T	402	377	400	414
End T	411	392	419	435
Gain	9	15	19	21

Key Words: Monensin, Bovine Somatotropin, Pasture

1036 Effects of lasalocid on the forage to concentrate ratio fed to steers maintained at pre-determined daily average ruminal pH. D.L. Prentice*, D.M. Schaefer, and G.R. Oetzel, *University of Wisconsin, Madison.*

Two experiments were conducted to evaluate the effects of lasalocid (325 mg·hd⁻¹·d⁻¹) on the forage to concentrate ratio fed to steers at a specific, pre-determined daily average ruminal pH. Eight ruminally cannulated Holstein steers were used in a two-by-two crossover trial. In both experiments corn silage was the only source of forage. Indwelling ruminal pH electrodes were used to continuously monitor ruminal pH and diets were adjusted daily for each steer to achieve the target ruminal pH. The daily average ruminal pH target was 6.0 in experiment one and 5.5 (the upper limit of subacute ruminal acidosis) in experiment two. In experiment two finely ground corn was used in a 50:50 mix with the whole kernel corn of experiment one to facilitate a lower pH. In both experiments lasalocid had no significant effect on the percent forage fed to maintain the pre-determined daily average ruminal pH. Lasalocid had no significant effect on DMI, the area of the ruminal pH curve under 5.5, ruminal pH variance, ruminal pH nadir, ruminal pH peak or overall ruminal pH range. The effects of lasalocid on total VFA concentration and VFA profiles were inconsistent in both experiments. The average ruminal pH in experiment one was 5.99 for lasalocid-fed animals and 5.98 for controls. It was possible to feed to an average daily ruminal pH of 6.0 by altering the forage and concentrate ratios on an individual basis.