other species. The data further suggest that high levels of dietary ALA may be needed to exceed the Km for d-6 desaturase.

Key Words: Delta 6 desaturase, Kinetics, Alpha linolenic acid

T104 The effect of dietary fat on the fatty acid composition of olfactory mucosal tissues in young adult dogs. C. T. Middendorf, K. A. Cummins*, E. A. Altom, and M. Craig-Schmidt, *Auburn Univeristy, AL* .

Previous studies have indicated that dogs fed a diet high in saturated fat had a decrease in olfactory acuity. A study was designed to determine the influence of dietary fat source on the phospholipid fatty acid composition of olfactory and respiratory mucosa in young-adult dogs. Fifteen young-adult female beagles (average age = 2 yr, body weight average = 9.69 kg) were randomly assigned to receive one of three diets varying in the amount and source of fat. These were Diet A, with 12% crude fat; Diet B, containing 16% crude fat formulated by the addition of 4% corn oil to the maintenance diet; and Diet C, containing 16% crude fat formulated by the addition of 4% coconut oil. Dogs were fed the diets for a period of sixty days, euthanized, and then samples were collected from the olfactory turbinates and nasal passage. Fatty acid compositions of phosphatidylcholine (PC) and phosphatidylethanolamine (PE) were analyzed by capillary gas chromatography. The amount of 16:0 in respiratory PC was greatest from dogs fed Diet B ($P<0.10$), while the amount of 20:4n-6 incorporated into respiratory PC was less ($P<0.10$). No differences were reported for the 20:4n-6 content in PC of olfactory mucosa ($P>0.10$). The amount of 18:2n-6 in PC from both mucosal tissues was greater in dogs fed Diet B than in dogs fed Diets A or C ($P<0.10$). Despite increased amounts of 18:2n-6 in Diet B, there were no differences among treatments in the amount of 18:2n-6 or 20:4n-6 incorporated into PE ($P>0.10$) of either tissue. No differences were observed in the ratio of unsaturated to saturated fatty acid incorporation into phospholipids ($P>0.10$), or in the mean chain lengths ($P>0.10$). No differences were observed in the unsaturation index for the PE fractions and the olfactory PC ($P>0.10$). However, the unsaturation index was lower in dogs fed Diet B in respiratory mucosal PC ($P<0.10$). Results from this study do not fully explain the differences observed in olfactory acuity.

Key Words: Canine, Nutrition, Lipids

T105 Heritability of hypoadrenocorticism in the Portuguese Water Dog and the Leonberger. A. M. Oberbauer*, K. N. Simpson, J. M. Belanger, and T. R. Famula, *University of California, Davis, CA*.

Hypoadrenocorticism (Addison's) is a recognized late onset disorder in the dog. Symptoms are diffuse and a result of deterioration of the adrenal cortex with its subsequent reduction in the capacity to synthesize and secrete glucocorticoids and mineralocorticoids. Diagnosis of Addison's is by ACTH stimulation challenge. Some breeds have a higher than expected incidence of Addison's suggesting a genetic component to the disorder. We have recently reported that Addison's has a genetic basis in the Bearded Collie and Standard Poodle although the mode of inheritance differed. Here we compare the heritabilities and mode of inheritance for the disorder in two additional but related breeds, the Leonberger and the Portuguese Water Dog (PWD). Owners were requested to submit data on the Addisonian status for the above-mentioned breeds along with pedigree, gender, and DNA. The binary nature of the data required a threshold model; a mixed Bayesian analysis model was used to arrive at heritability estimates. Complex segregation analyses were employed to characterize mode of inheritance. The heritability estimates for Addison's disease in the Leonberger (n=294 dogs) and PWD (n=504) were 0.62 and 0.57, respectively. In contrast to the findings in Standard Poodles, the Leonberger and PWD data do not support a single locus of large effect influencing the transmission of Addison's disease. However, when the Leonberger data is corrected for ascertainment bias, the major gene model becomes significant. Although these findings may reflect limited sample sizes, the possibility that different though related breeds have unique patterns of inheritance for Addison's disease may affect the search for genes causal in the expression of canine Addison's.

Key Words: Hypoadrenocorticism, Dog, Heritability

Horse

T106 Use of ass's milk for novel probiotic beverages. E. Salimei*[1], E. Sorrentino[2], M. Succi[2], F. Fantuz[3], G. Varisco[4], and R. Coppola[2], [1]*Dept. SAVA, Univ. of Molise, CB Italy,* [2]*Dept. STAAM, Univ. of Molise, CB Italy,* [3]*Dept. Sci. Vet., Univ. of Camerino, MC Italy,* [4]*Ist. Sperim. Zooprofilattico, Brescia Italy.*

Nutritional and therapeutic properties of ass's milk are known since ancientry, and recent clinical studies confirm its efficacy in the treatment of most complicated cases of infants' multiple food intolerance. In order to deepen the knowledge on ass's milk and its feasible production, 6 asses were studied over two consecutive lactations (150 days/lactation). During the experimental period asses, machine milked, produced in average 740 mL milk/milking; milk yield was higher in the second lactation. Results on ass's milk chemical composition confirm the relative dilution of this product characterized by low fat (averaging 0.38%) and protein (1.72%, in average) contents but with a high lactose content (mean value 6.88%). Protein fraction of ass's milk showed a low protein allergenic content along with a higher content of lysozyme (1.5 g/L). Moreover, due to its high lactose content, ass's milk could be placed amongst the new generation of milk beverages making it possible to effectively combine the advantageous properties of the raw ingredient with lactic acid bacteria. The high levels of lysozyme detected in raw and heat-treated ass's milk could explain the observed low bacterial concentration ($4x10^4$ CFU/mL) of raw milk. Besides this, pH values of control milk (heat-treated and uninoculated) were stable throughout the experiment (15d), confirming the possible role of lysozyme. Ass's milk revealed to be a good growth medium for potentially probiotic lactobacilli strains since pH ranged between 3.67 and 3.85 for all the tested strains after a 48 hour period of incubation. Values were stable up to the end of the experiment. Results evidenced that ass's milk can be adopted as a substrate of probiotic and therapeutic beverages.

Key Words: Ass's milk, Probiotic beverages, Hypoallergenic food

T107 The influence of training on flat walking temporal variables of Tennessee Walikng Horse yearlings. K. M. Holt* and M. C. Nicodemus, *Mississippi State University, Mississippi State, MS*.

Tennessee Walking Horse (TWH) gaits are often described as learned, placing great importance on the training of young horses. To determine the impact of training on yearling TWH gaits, temporal variables were measured before and after a 60-day training period. 60 Hz frame-by-frame analysis was done before and after training to measure temporal variables and kinematic analysis determined velocity and wither height. Five strides of a consistent flat walk with a velocity of 1.7 (0.2) m/s were measured for 4 yearlings. Means (SD) were determined with temporal variables given as % of stride and paired t-tests ($P=0.05$) were used to determine differences before (T1) and after (T2) the training period (Table 1). The flat walk was determined to be a symmetrical, 4-beat gait with an irregular rhythm and lateral couplets. The stride alternated between periods of bipedal and tripedal support in which the lateral bipedal support was longer than the diagonal. The majority of the stride was spent in a stance phase with a similar percent of stance for both the fore and hind limbs. These characteristics did not significantly change after the training period. Flat walking weanlings were found to have similar characteristics as the yearlings, except for some of the weanlings demonstrated regularity of rhythm with an equal percentage of lateral and diagonal bipedal support. This may indicate more of a relationship between growth and temporal variables, rather than training. Understanding the influence of such variables as growth and training on TWH gaits will assist in both clinical and performance applications.

	T1	T2
Height(m)	1.4(0.1)	1.5(0.1)
Stride Duration(ms)	1055(33)	1098(27)
Fore Stance(%)	59(2)	61(2)
Hind Stance (%)	59(1)	61(1)
Lateral Advanced Placement(%)	19(5)	20(4)
Diagonal Advanced Placement(%)	30(4)	30(4)
Lateral Advanced Lift-Off(%)	22(8)	21(6)
Diagonal Advanced Lift-Off(%)	31(6)	29(5)
Bipedal Support(%)	62(5)	55(2)
Tripedal Support(%)	38(3)	45(2)

Table 1: Mean values (SD) for the temporal variables.

Key Words: Tennessee Walking Horses, Temporal variables, Training

T108 Walking temporal variables of the padded Tennessee Walking Horse.

M. C. Nicodemus* and K. M. Holt, *Mississippi State University, Mississippi State, MS*.

Shoeing is a major component of showing for the Tennessee Walking Horse (TWH). The most popular TWH show classes are the padded classes in which multiple wedges are added to the front hooves to enhance the horse's performance. To better understand the influence of this shoeing on the gaits, the flat and running walks temporal variables of the padded TWH were measured and compared to earlier studies done on the flat shod TWH. 4 padded, show horses were ridden at the flat and running walks while being filmed. Shoeing weight, height, and angles met TWH show standards for open padded classes. 60 Hz frame-by-frame analysis of the video determined stride duration and percent of stride duration for fore and hind stance; lateral and diagonal bipedal, unipedal, and tripedal support; and lateral and diagonal advanced placement and lift-off. Means (SD) are given in the table with similar superscripts between variables within a gait representing significant differences according to paired t-tests ($P<0.05$).

Both gaits had longer hind stance and diagonal advanced lift-off. The flat walk had a regular rhythm with longer lateral bipedal support. The running walk had an irregular rhythm with diagonal couplets and even periods of bipedal support. In comparison to earlier flat shod TWH studies, the flat shod flat walk had shorter periods of forelimb swing and single hind limb support while demonstrating a period of tripedal support with two forelimbs. The flat shod running walk compared to the padded demonstrated lateral couplets while having a shorter period of single hind limb support and uneven periods of bipedal support. The flat shod and padded TWH gaits may be different due to shoeing. Further shoeing research can assist in both the clinical and performance evaluations of the TWH.

Temporal Variables	Flat Walk	Running Walk
Stride Duration(ms)	794(27)	783(21)
Fore Stance(%)	$36(3)^a$	$36(2)^a$
Hind Stance(%)	$54(2)^a$	$54(2)^a$
Diagonal Adv. Placement(%)	21(8)	$14(9)^b$
Lateral Adv. Placement(%)	29(4)	$36(4)^b$
Diagonal Adv. Lift-Off(%)	$38(8)^c$	$36(4)^c$
Lateral Adv. Lift-Off(%)	$13(8)^c$	$14(4)^c$
Single Hind Support(%)	28(4)	28(3)
Diagonal Bipedal Support(%)	$23(4)^d$	28(7)
Lateral Bipedal Support(%)	$40(6)^d$	35(5)
Tripedal Support-2 Hind Limbs(%)	8(2)	9(1)

Key Words: Tennessee Walking Horses, Temporal variables, Shoeing

T109 Effects of post-partum ivermectin administration to broodmares on the incidence of foal-heat diarrhea.

S. E. Harris[1], M. M. Vogelsang*[1], E. E. Bass[2], and G. D. Potter[1], [1] *Texas A&M University, College Station, TX USA*, [2] *University of Georgia, Athens, GA USA*.

Foal-heat diarrhea (FHD) is the most common self-limiting diarrhea in foals less than two weeks of age with an incidence as high as 70-80 percent. Although FHD does not seem detrimental to long-term health, it does present a management problem and can predispose foals to more severe diarrhea. It has been proposed that the parasite, *Strongyloides westeri*, could be the causative agent for FHD since infestations in foals develop about 10 to 14 days of age. The objective of this on-farm study was to determine the efficacy of post-partum anthelmintic treatment of mares for reducing the incidence and/or severity of FHD in foals. Although a number of anthelmintics are effective against *S. westeri*, ivermectin was utilized because of availability and efficacy against milk borne strongyloides infestations. Twenty-four mares and their foals were alternately assigned to a treated or non-treated group according to expected foaling date. Treatment consisted of oral administration of Zimectrin® to the dam within 12 h post-foaling. From d1 through d25, foals were weighed and vital signs, incidence or absence and severity of diarrhea recorded. Incidence scores (severity of diarrhea) were assigned on a 0-3 scale with 0 being absence of symptoms and 3 being extremely profuse diarrhea. Only 1 foal (from the treated group) did not demonstrate symptoms of diarrhea during the 25-day data collection period. Foals from treated mares had symptoms of diarrhea from d2 through d21 and those from non-treated mares from d2 through d25. The greatest number of foals from treated mares showed symptoms from d8 through d13 while those from non-treated mares showed symptoms from d9 through d18. There was no difference in incidence scores due to treatment; however there was a trend for foals from treated mares to experience a more severe diarrhea over a shorter duration. There was no difference in weight change related to treatment or non-treatment of mares. Post-partum administration of ivermectin to mares did not decrease the incidence or severity of diarrhea in foals or affect growth rate of foals.

Key Words: Foal heat diarrhea, *Strongyloides westeri*, Ivermectin

T110 Body condition scores and biometric measurements to predict body weight in warm blood German riding horses.

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Existing systems of body condition scoring (BCS) and biometric measurements were developed for other breeds but not for warm blood German horses. Consequently there are some problems with transferring these systems to German warm bloods, such as more prominent hook bones in this breed. The present investigation was carried out to adapt existing BCS systems (scale 1 emaciated – 9 obese) to German horses, especially with regard to frequently asked questions of the owners, and to develop a more reliable method to predict body weight from biometric measurements in this breed. For adaptation of the BCS-System of Henneke et al. (1983) 145 horses were scored. In addition to sonographic measurements, in some cases, post mortems, measurements of skinfold thickness, and neck fat were carried out. Several horses with substantial changes of BCS were observed over time. In total 181 horses were scored, measured and weighed. The heart girth, withers height (measured by tape and by rule), circumference of horse (at the height of pin bones), circumference of cannon bone, and circumference of neck base were measured to develop a predictive equation by multiple regression calculation. The following equation was obtained: Body weight (kg) = -1160 + 2.594*withers height (by tape, cm) + 1.336*heart girth (cm) + 1.538*circumference of horse (cm) + 6.226*circumference of cannon bone (cm) + 1.487*circumference of neck base (cm) + 13.63* BCS (points); r=0.94**. This equation was applied to 139 other horses (actual body weight 365-742 kg). The regression equation between predicted and actual body weight (predicted body weight=0.84*actual body weight +86; r=0.918**, SE=17) demonstrates a high predictive precision of this equation for warm blooded German horses.

Key Words: Body condition scores, Body weight prediction, Warm blood horses

T111 Effects of feeding a blend of grains naturally-contaminated with *Fusarium* mycotoxins on feed intake and indices of athletic performance of horses.

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An experiment was conducted to determine the effect of feeding blends of grains naturally-contaminated with *Fusarium* mycotoxins to mature horses and to test the efficacy of a polymeric glucomannan mycotoxin adsorbent (GM polymer, MTB-100, Alltech Inc.) in preventing *Fusarium* mycotoxicoses. Six mature, light, mixed breed mares were assigned to one of three dietary treatments for 21 days following a duplicated 3 x 3 Latin square design. Feed consumed each day was a combination of up to 3.5 kg of concentrates and 5.0 kg of mixed timothy/alfalfa hay. The concentrates fed included: (1) control (2) blend of 36% contaminated wheat and 53% contaminated corn and (3) contaminated grains + 0.2% GM polymer. Diets containing contaminated grains averaged 11.0 ppm deoxynivalenol, 0.7 ppm 15-acetyldeoxynivalenol and 0.8 ppm

zearalenone. Feed intake and body weight were monitored over a 21-day period. Horses were maintained on a fixed exercise schedule during the supplementation phase. At the end of the supplementation phase each horse completed a time to fatigue treadmill step test. Parameters measured during pre-test, each step of the test and 5 and 10 minutes post-test were: (1) time to fatigue (2) heart rate (3) hematology (4) serum lactate levels. Feed intake of horses fed contaminated grains was significantly reduced compared to controls throughout the experiment. Consumption of forage remained unaffected regardless of diet fed. Significant weight loss over 0 to 21 days was observed in horses fed contaminated grains as compared to control. Horses fed contaminated grains had significantly higher serum lactate levels at time of fatigue, while levels were significantly reduced 10 minutes post-test. It was concluded that horses are susceptible to *Fusarium* mycotoxicoses as indicated by appetite suppression and weight loss.

Key Words: Deoxynivalenol, Equine, Exercise

Rabbit

T112 Effect of doe-litter separation on reproductive performance of lactating rabbits does. A. Espinosa, R. Lazaro*, R. Carabaño, and P.G. Rebollar, *Universidad Politecnica de Madrid. Spain.*

Two trails were conducted to study the influence of separating the litter from the doe for 53 h on fertility and reproductive parameters of multiparous Californian x New Zealand White crossbred female rabbits. There were two treatmeants; a control group in which litters had free access to nursing and a bioestimulated group in which litters were separated from their does from Day 9 (9:00 a.m) to Day 11 (14:00 p.m) postpartum. All the does were artificially inseminated (AI) between 10:00 and 11:00 a.m of Day 11 postpartum. In trail 1, a total of 419 AI (experimental unit), carried out in 132 multiparous does, was analyzed to determine fertility rate (number of farrowing/number of AI x 100). Separation of the litter from the doe increased fertility with respect to the control group (68% vs 53%, $P < 0.001$). In fact, fertility rate was 38%, 30%, and 31% higher for 2nd, 3rd, and 4th parturition ($P < 0.05$) for the bioestimulated does. In trial 2, a total of 16 does, between 3rd and 6th farrowings and having more than seven suckling rabbits at parturition were used to estimate milk production from 1 to 21 d postpartum. The experimental treatments were the same than in trial 1 and there were eight replicates (one doe) per treatment. Milk production was higher in the control than in the bioestimulated does (5,090±161 vs 4,593±150 g, $P < 0.05$). In fact, on Day 12, 13, 14, and 15 of the lactation period, milk production was 40% ($P < 0.0001$), 18% ($P < 0.05$), 15% ($P < 0.05$), and 15% ($P < 0.01$) higher for the control than for the bioestimulated group, respectively. Also, restricting suckling for 53 h from Day 9 to Day 11 of lactation increased oestradiol 17-β during 48 h after the separation and reduced prolactin serum concentrations 24 h after the separation. We concluded that bioestimulation increased fertility rate, specially from the 2nd to the 4th farrowing, but reduced milk production during the first 21 d postpartum.

Key Words: Doe-litter separation, Rabbit fertility, Milk production

T113 Milk production evaluation in rabbits milking one or two times a day. R. Salcedo-Baca*[1,2], J. L. Echegaray-Torres[2], and A. Robinson[1], [1]*University of Guelph, Guelph, ON, Canada,* [2]*Universidad Autonoma Chapingo, Texcoco, Estado de Mexico, Mexico.*.

Milk production (MP) is an important trait for profitability of rabbit production, since it affects the litter weaning weight. Currently, under a typical management system, the doe is allowed to milk her litter only once a day for 5 to 10 minutes. Some reports in the literature have indicated that around 20 to 30 % of the does would get into the nest to milk 2 times a day if they were allowed. The objective of this study was to evaluate the effect of the number of times milked in a day (one or two) on the total milk production of the doe. In the Universidad Autonoma Chapingo, Mexico rabbitery, sixteen multi-parous New Zealand does with their litters (85 young) were evaluated for a lactation period of 35 days (during January and February, 2003). Every day the litter was weighed before and after milking in order to measure the MP of the doe. Does were separated into morning only milking (T1, n=7) and morning and night milking (T2, n=9). SAS PROC GLM was used to analyze the records, fitting a model including milking pattern, and litter size at birth, day 3, 15 and 30 as covariates. The model explained 75% of the variation. Highly significant differences were found between treatments: 3232g and 4070g for T1 and T2 respectively, the litter size was a significant variable as well. To investigate the effect on fertility, the does were not allowed to milk on day 10 and artificially inseminated (AI), on day 11 after parturition. Pregnancy diagnosis through abdominal palpation was conducted 11 days after breeding. T1 and T2 had 72% and 89% of pregnancy respectively. There were no significant differences in the doe weight change during the last 2 weeks of the experiment. For the entire period mortality of the young was 8.6% and 6.0% for T1 and T2 respectively. The average individual weight of the young at the end of the test was 511g and 657g for T1 and T2, with litter size of 4.6 and 5.2 respectively. Two times a day milking, when labor cost is not expensive, is thus recommended.

Key Words: Rabbit, Milk, Production

T114 Parturition synchronization in rabbits using prostaglandins: Optimal time for hormone application. J. L. Echegaray-Torres*[1], R. Salcedo-Baca[1,2], and C. Flores-Martinez[3], [1]*Universidad Autonoma Chapingo, Chapingo, Edo. de Mexico,* [2]*University of Guelph, Guelph, ON, Canada,* [3]*Instituto Tecnolgico Agropecuario de Oaxaca, Oaxaca, Mexico.*

Currently, industrial rabbit systems typically manage does in sets (bands). Each set of does is artificially inseminated together, but parturition can occur over a 4 d period. This spread in parturition time increases labor demands to attend to does, or alternatively, increases the risk of mortality in the progeny. In addition, fostering young from bigger to smaller litters increases in difficulty as age gaps widen. The objectives of this study were to use pregnant N.Z. White does to 1) evaluate the effectiveness of prostaglandins (PG) in syncronizing parturition and 2) discern optimal PG application times. In Exp. 1, 39 (Jan. 2001) and 31 (Nov. 2002) does were injected with PG 29 d post-insemination (100 mg PG/doe; T1). Respective control groups (T2) contained 38 and 27 does. Time of parturition was measured in hours considering zero the moment of hormone application. Time of parturition was higher (P=0.05) in between treatments 53:55 and 66:22 for T1 and T2 respectively. Also, more (97% vs. 60%;) deliveries occurred within 48 h from start of first delivery in T1 than in T2. Litter size at birth (live progeny) was similar in T1 (7.8) and T2 (8). In Exp. 2 (Jan. 2003), different PG application days and times post-insemination (same dose as Exp.1), were tested against a control group (Td), d 29 am (Ta), d 29 pm (Tb), and d 30 am (Tc), each group with 20 does. There were significant differences between treatments in time of parturition (50:42ab, 54:07b, 43:25a, and 55:10b for Ta, Tb, Tc and Td respectively). Parturitions recorded in the first 24 h after the first delivery was 69, 89, 43, and 70% for Ta, Tb, Tc, and Td respectively. In conclusion, injection of 100 mg/doe PG on day 29 (pm) of pregnancy is recommended for rabbit production systems where does are managed in sets.

Key Words: Rabbits, Parturition, Synchronization

T115 The shape of the lactation curve in rabbits milking once or twice a day, and the function to estimate the total milk production. R. Salcedo-Baca*[1,2], J. L. Echegaray-Torres[2], and A. Robinson[1], [1]*University of Guelph, Guelph, ON, Canada,* [2]*Universitad Autonoma Chapingo, Texcoco, Edo. de Mexico, Mexico.*

A typical doe production milk (MP) curve starts with around 50g/day increasing to reach a peak, between 200 and 250g, around day 21 and then declines to day 30 when it varies around 150g. The total MP is affected by the litter size. The persistency is known to be influenced by the breed-back schedule; shorter days open results in the MP declining sooner. To predict the total MP the following regression equation is recommended (RER) in the literature to model a rabbit lactation curve (LC): MP = 1.77 + 1.39 LW21, where LW21 is the litter weight at day 21. Currently milking in rabbits, under commercial production systems, is restricted to once a day. The aim of this study was to find out if there are differences in total MP, shape of the lactation curve and goodness of