PHARMACOLOGY AND TOXICOLOGY

294 Effect of ergot alkaloids on endocrine profiles in late luteal phase cows. R. Browning, Jr.[1]*, F. N. Schrick[2], F. N. Thompson[3], H. M. Smith[1], and S. C. Landry[1], *[1]Tennessee State University, Nashville, [2]University of Tennessee, Knoxville, and [3]University of Georgia, Athens.*

Endocrine responses to ergot alkaloids, reputed agents of fescue toxicosis, were examined in six Holstein cows (499 kg; SD = 29) nursing their calves. Estrus detection was done twice daily. Weekly plasma progesterone concentrations confirmed estrus dates. Each cow received one i.v. infusion of saline (SAL), ergonovine maleate (9.5 mg; EM), or ergotamine tartrate (9.5 mg; ET) per estrous cycle (15 to 16 d after estrus) and all treatments during the study. Blood was sampled every 20 min for 5 h; treatments given after 1 h. Air temperature (26°C) and respiration rate (RR) were recorded hourly. Treatment × time influenced RR ($P = .06$) and plasma concentrations of prolactin (PRL; $P = .13$), luteinizing hormone (LH; $P = .02$), and 13,14-dihydro-15-keto-prostaglandin $F_{2\alpha}$ (PGFM; $P < .001$), but not follicle stimulating hormone ($P = .81$). Saline did not affect any trait in this study. Concentrations of PRL decreased ($P < .01$) from 6.56 ng/mL before EM to ≤ 3.54 ng/mL during the second and third hours after EM, respectively. Concentrations of LH declined ($P < .01$) from .56 ng/mL before EM to .50 ng/mL during the third hour after EM. Mean RR and PGFM concentrations were not affected by EM. Administration of ET significantly altered RR, PRL, LH, and PGFM (table). A higher proportion ($P < .03$) of cows had increased PGFM concentrations after ET (5/6, 83.3%) than after SAL (1/6, 16.7%). Peak PGFM response was higher ($P < .03$) after ET and EM (20.7 and 16.5 pg/mL, respectively) than after SAL (3.2 pg/mL). Ergot alkaloids may modify concentrations of blood constituents important for reproductive function of cows during the late luteal phase of the estrous cycle.

	Hour				
ET-treated cows	1	2	3	4	5
RR, breaths/15 s	10.5	11.8	15.7[x]	17.2[x]	17.4[x]
PRL, ng/mL	5.87	2.81[x]	1.65[x]	1.34[x]	1.45[x]
LH, ng/mL	.57	.56	.54	.53	.51[x]
PGFM, pg/mL	50.9	55.5	57.4[x]	63.9[x]	60.7[x]

[x]LS Means within row differ from Hour 1 pretreatment mean ($P < .01$).

Key Words: Cows, Ergot Alkaloids, Hormones

295 Ergot alkaloids alter plasma concentrations of cortisol and thyroid hormones in cattle. R. Browning, Jr., M. L. Leite-Browning, H. M. Smith, *Tennessee State University, Nashville.*

In Exp. 1, seven Angus steers (294 kg) received one i.v. infusion of saline (SAL), ergonovine maleate (7 mg; EM), or ergotamine tartrate (7 mg; ET) per week and all treatments during the study. Blood was sampled every 30 min for 5 h; treatments given after 1 h. Treatment × time affected plasma cortisol ($P < .01$) and triiodothyronine (T_3; $P = .1$) concentrations. Cortisol concentrations were not affected by SAL or EM. Cortisol concentrations were higher ($P < .01$) each hour after ET (≥ 59 ng/mL) than before ET (19 ng/mL). Concentrations of T_3 were not affected by SAL. Plasma T_3 increased ($P < .01$) from 1.12 ng/mL before EM to 1.35 ng/mL during the first 2 h after EM and from 1.21 ng/mL before ET to 1.41 ng/mL during the first hour after ET. Treatment × time tended ($P = .18$) to affect thyroxine (T_4) concentrations. Concentrations of T_4 were not affected by SAL or EM. Plasma T_4 concentrations before ET were lower ($P < .01$) than after ET (63.5 vs 74.4 ng/mL). In Exp. 2, six Holstein cows (499 kg) nursing calves received one i.v. infusion of SAL, EM (9.5 mg), or ET (9.5 mg) per estrous cycle and all treatments during the study. Blood was sampled every 40 min for 5 h; treatments given after 1 h. Treatment × time affected plasma cortisol ($P < .01$), T_3 ($P = .14$), and T_4 ($P = .07$) concentrations. Cortisol concentrations were not affected by SAL or EM. Cortisol concentrations were higher ($P < .01$) during the first 2 h after ET (64 ng/mL) than before ET (27 ng/mL). Concentrations of T_3 were similar before SAL and ET (.84 and .83 ng/mL) but were higher ($P < .01$) after ET than after SAL (.91 vs .81 ng/mL). Concentrations of T_4 were not affected by SAL. Concentrations of T_4 during the first and second 2 h (38 ng/mL) after EM were higher ($P < .01$) than before EM (33 ng/mL). Plasma T_4 during the first and second 2 h (≥ 42 ng/mL) after ET were higher ($P < .01$) than before ET (36 ng/mL). Ergot alkaloids may alter plasma concentrations of hormones important for metabolic and thermoregulatory functions of cattle.

Key Words: Cattle, Ergot Alkaloids, Cortisol, Thyroid Hormones

296 Effect of fumonisin contaminated feeds on goats. N. K. Gurung*, D. L. Rankins, Jr., and R. A. Shelby, *Auburn University, AL.*

Fumonisins are the most ubiquitous mycotoxins produced mainly by *Fusarium moniliforme* and *Fusarium proliferatum*, in corn and corn-based feeds and foods. Fumonisin mycotoxicoses are well documented in horses and swine but limited information is available for ruminants. In a 112 d feeding trial, eight yearling Angora goats(15 ± 2.1 kg BW) were assigned randomly to 2 treatments (4 goats per treatment): 0 mg of fumonisin B_1(FB_1) (control) and 50 mg of FB_1/kg of feed (treated). The base diet contained 62% corn, 22% cottonseed hulls, 9.25% soybean meal(10.7% CP, .98 Mcal NE_g/kg). Fumonisin containing culture material (2,326 mg FB_1/kg) was added to the diet to achieve the desired FB_1 level. Feed consumption was recorded daily throughout the experiment and BW were measured on d –1, 21, 56, 84, and 112. A digestibility trial was conducted during the last 7 d of the experiment. At the end of the trial, all goats were euthanized and liver, kidney and heart samples were analyzed for sphingolipid concentrations (free sphingosine (So), free sphinganine (Sa), and Sa/So ratios). No differences (P>.05) were found for DMI (587 vs 529 g/d), DM digestibility(76 vs 77 %), OM digestibility (76 vs 78 %), NDF digestibility (23 vs 39 %), ADF digestibility (7 vs 24 %), water intake (1487 vs 961 ml/d) or N retention (2.48 vs 2.43 g/d) between control and treated groups. Average daily gain tended to be lower in treated animals (48.6 vs 29.4 g/d; P=.14). Free So, Sa and Sa/So ratios were elevated (P<.05) in treated goats. Liver, kidney and heart were affected (P<.05) except that the Sa/So ratio was not different for heart. Among tissues, liver sphingolipid concentrations were more sensitive to fumonisin exposure than kidney and heart tissues. Goats exposed to FB^1 (50 mg/kg feed) exhibit elevated levels of free sphingoid bases. Exposure to FB^1 had little effect on feed intake, feed digestibility and average daily gain.

Key Words: Goats, Fumonisin, Sphingolipid

297 Results of FDA's genetically modified plant notification procedure. W. D. Price* and M. Alewynse, *Center for Veterinary Medicine, Rockville, MD.*

In 1992, FDA issued a policy statement clarifying its role in the regulation of GMPs. The FDA also initiated a voluntary consultation procedure where the GMP developer consults with FDA about safety and regulatory issues prior to marketing. Typically, the developer makes an initial oral presentation, followed by submission of a summary of the safety and nutritional assessment of the GMP to FDA. Twenty five consultations involving eight different crops, including both human foods, such as tomatoes, and traditional animal feedstuffs, like corn, soybeans, cotton, and canola, have been completed. The primary focus for feedstuffs has been insect resistance and plant tolerance to herbicides. Developers have provided information on the identity and function of introduced genetic material, including marker genes, and on the identity, function, and concentration of the expression products encoded by the introduced DNA. The NPTII expression product from one marker gene, kan^r, was cleared as a food additive by FDA. No other expression product has been declared a food additive by FDA. For each GMP, developers have documented possible changes in nutrient composition, e.g., protein, fat, carbohydrate, ash, and fiber. Developers have also investigated possible changes in a) ADF and NDF in corn forage, b) amino acid profiles in soybeans, corn grain, cottonseed meal, and canola meal, c) fatty acid profiles in cottonseed and corn oils, and d) toxin content, such as gossypol in cottonseed meal and erucic acid and glucosinolate in canola meal. For the consultations completed to date, all nutrient and toxin analyses indicate that GMP composition is not materially different from non-modified plant varieties.

Key Words: Biotechnology, Feed composition

298 Effects of vitamin A injection on the response to superovulation in beef cattle. B. S. Brown, C. S. Whisnant*, and B. K. Reed, *Texas Tech University, Lubbock.*

The objective of this study was to determine the effects of vitamin A injections on total number of oocytes, number of transferable embryos, and percent transferable embryos in superovulated beef cows. Injections of 1 million units of vitamin A to sows have been reported to increase litter size in sows in some studies. Additionally, it was reported that vitamin A treatment could improve the number of transferable embryos in superovulated cattle (Shaw, et al., 1995 Theriogenology 44:51-58). The study was conducted at a commercial embryo transfer facility and was analyzed as a completely randomized design, with n=17 for control cows (C) and n=10 for cows receiving vitamin A injections (VitA). One million international units of vitamin A from a commercially available preparation were injected intramuscularly into donor cows at the start of FSH treatment for superovulation. Cows were injected with decreasing doses of FSH every 12 h for 4 d (total 32 mg FSH). On day 5, donors were bred, and uterine flushing occurred on day 12. A single technician counted and graded all oocytes and embryos, flushed donor cows, and administered FSH injections. No differences due to vitamin A injection were observed for total number of oocytes (C=16.8, VitA=15.9; P=0.20), number of transferable embryos (C=7.6, VitA=5.3; P=0.85), or percent transferable embryos (C=49.5%, VitA=39.0%; P=0.27). No difference in embryo quality score was seen between treatments. We conclude that vitamin A had no effect on the response to superovulation in donor beef cows in this study. A portion of each donor cow s embryos were freshly transferred to recipients, while the remainder of the embryos were frozen for later transplantation. Pregnancy data from recipients will be included in the presentation.

Key Words: Vitamin A, Superovulation, Beef cattle

299 The effects of antibiotics on bovine embryo development in vitro. S. Wang*, G. R. Holyoak, G. Liu, J. Dan, and T. D. Bunch, *Utah State University, Logan.*

The effects of antibiotics (amphotericin B, penicillin G and streptomycin) on bovine embryo development in vitro was investigated using a randomized complete block design with 3 treatments in 4 blocks. Oocytes were aspirated from abattoir ovaries and procedures for in vitro maturation (IVM), in vitro fertilization (IVF), and in vitro culture (IVC) followed Bavister et al. (Theriogenology 37: 127-146, 1992), except antibiotics were added to the IVC medium according to treatment. Treatments (TRT) consisted of: TRT1, 100 IU penicillin G (Sigma, P4687) and 100 μg streptomycin (Sigma, S1277) per ml IVC medium and TRT2, 100 IU penicillin G, 100 μg streptomycin and 0.25 μg amphotericin B (Gibco, 15240-039) per ml IVC medium. The Control IVC medium did not contain antibiotics. Cleavage rates were determined at 45 h after fertilization. Embryonic development was evaluated on day 8 of culture. The data were analyzed by ANOVA. The percentage of cleaved ova were 87.3 (178/204), 90.9 (168/185) and 88.2 (163/185) for TRT1, TRT2 and Control, respectively. The percentages of morula production were 18.0, 26.8 and 21.5 for TRT1, TRT2 and Control, respectively. The percentages of blastocyst production were 12.9, 14.5 and 15.6 for TRT1, TRT2 and Control, respectively. There were no significant differences (P>.05) in cleavage rates, morula and blastocyst production between treatments. There were no significant differences (P>.05) in the rates of degenerated embryos after day 8 in culture, which were 31.4%, 28.3% and 33.2% for TRT1, TRT2 and Control, respectively. We conclude that amphotericin B, penicillin G and streptomycin have no apparent detrimental effect on early embryo development and therefore can be used against potential contamination during in vitro embryo culture.

Key Words: Amphotericin B, Penicillin G, Streptomycin, In vitro fertilization, Bovine

300 Endothelin response to tall fescue alkaloid stimulus of bovine endothelial cells. J. R. Strickland[1]*, J. W. Oliver[2], E. M. Bailey[2], J. B. Taylor[1], and J. Nordyke[1], *[1]New Mexico State University, Las Cruces and [2]University of Tennessee, Knoxville.*

Alkaloids, particularly ergot alkaloids found in tall fescue (*Festuca arundinacea*), are known to cause vasoconstriction. Endothelin (ET), produced by endothelial cells (EC), is a potent vasoconstrictor. Therefore, the hypothesis that endothelin secretion would increase due to alkaloid treatment of endothelial cells in vitro was tested. Two trials were conducted to determine the effects of 24-hour alkaloid exposure on ET secretion by bovine EC in vitro. In both trials, EC were seeded (5000 cells/well) into 96-well culture plates and grown to confluency (~48 hr) and then treated (24 hr). Trial 1 (n=8) treatments were a-ergocryptine (AE), ergovaline (EV), ergonovine (EG), N-acetyl loline (NAL), and N-formyl loline (NFL) at 0, 10^{-4}, 10^{-5}, 10^{-6}, 10^{-7}, and 10^{-8} M. Trial 2 (n=8) included all treatments of trial 1 however, dose response curves included 10^{-9}, 10^{-10} and 10^{-11} M. Controls for both trials were culture medium containing respective alkaloid carriers. An enzyme immunoassay was used to measure ET accumulation in culture medium. Both, EV and AE inhibited (18 to 100% inhibition; P<.05) ET secretion regardless of concentration in both trials. Additionally, EG was inhibitory (13 to 34% inhibition; P<.05) at concentrations of 10^{-4}, 10^{-5}, 10^{-6}, 10^{-7}, and 10^{-8} M. Likewise, NFL was inhibitory (16 to 33% inhibition; P<.05) only at 10^{-4}, 10^{-5}, 10^{-6}, and 10^{-7} M for both trials. N-Acetyl loline did not exhibit consistent effects in either trial. These results do not support the hypothesis that the alkaloids would increase endothelial cell secretion of endothelin in vitro. Possible explanations for the current findings may include activation of cellular inhibitory second messenger systems and/or negative feedback regulation by endothelin in the culture medium (i.e., build up of endothelin in culture medium may cause activation of inhibitory pathways for endothelin production).

Key Words: Endothelin, Cattle, Tall fescue, Alkaloid

301 Potential benefit of an anthelmintic in reducing hyperthermia associated with fescue toxicosis. D. E. Spiers*, B. L. Snyder, P. A. Eichen, G. E. Rottinghaus, and G. B. Garner, *University of Missouri, Columbia.*

Tests were conducted using a rat model to determine if an anthelmintic and gamma-aminobutyric acid agonist (Ivomec®Merck & Co., Inc., Rathway, NJ) is effective in reducing the hyperthermic effect of ergovaline (EV), a primary toxin in endophyte-infected tall fescue. Male rats (50 days age) were IP injected with Ivomec (0.1 mg/kg BW) or sterile water at either 21 (thermo-neutral;TN) or 31°C(heat stress;HS) ambient temperature (T_a). All animals were tested 7 days postinjection at HS to determine thermoregulatory response to EV injection(35 μg IP/kg BW) over 120 minutes. Average body mass increase from day 1 was reduced in HS (P≤.0001) and Ivomec (P≤.06) rats compared to TN and control rats, respectively. Average change in feed intake was also reduced in HS (P≤.03) and Ivomec (P≤.05) rats. EV injection at 7 days resulted in an average rectal temperature (T_{re}) increase of 1.9°C (P≤.0001), with 1.2°C lower increase (P≤.0001) in Ivomec-treated rats compared to controls. HS pre-exposure resulted in a 0.5°C lower T_{re} response to EV (P≤.0001) compared to TN rats. EV injection decreased tail-skin temperature by 1.3°C (P≤.0001) to suggest peripheral vasoconstriction. Thermal circulation index (TCI)(i.e., an index of peripheral vasoconstriction) decreased 1.46 at 120 minute postin- jection (P≤.0001). TN rats exhibited a greater decrease in TCI than HS rats (P≤.0001) to suggest increased responsiveness to EV. In addition, TCI response of HS rats pretreated with Ivomec was less than for controls (P≤.06).A separate study at 31°C Ta, to determine if the Ivomec benefit extended to 14-28 days post-treatment, showed no evidence of an effect on feed intake or body weight gain. Likewise, there was no indication of an Ivomec effect on EV response. These results indicate that pretreatment with Ivomec produces a short-term (i.e., 7 day) reduction in the thermoregulatory response to ergovaline.

Key Words: Rats, Fescue toxicosis, Heat stress

302 Ingestion of snakeweed *(Gutierrezia* spp.) does not alter serum progesterone concentration in beef cows and ewes. T. T. Ross, M. C. Whitehead, S. L. Slate, and J. R. Strickland, *New Mexico State University, Las Cruces.*

Snakeweed (*Gutierrezia* spp.) has been shown to cause reproductive failure in livestock grazing native rangelands infested with the plant. Three experiments were conducted to determine the effects of ingested fresh-frozen snakeweed (SW) on serum progesterone concentrations in cattle and sheep. Two experiments were conducted using 9 crossbred beef cows. Cows were assigned to one of three dietary treatments: control, grass hay only (1.3% BW); hay+corn (.63 kg/day); and hay+.80 kg of a 42% CP supplement/day. Cows consumed these diets for 68 d after which SW (10% of diet DM) was added to their diets for an additional 68 d. Estral activity was monitored throughout the experiments via ultrasonography of ovaries. The second cow experiment was conducted similarly. Dietary treatments did not alter (P>.50) estral cyclicity in either trial. Also, serum progesterone was not influenced (P>.30) by either dietary treatments on SW ingestion. For this comparison, progesterone was measured during a synchronized estrous cycle. During this time, area under the progesterone curve was similar (P>.50) between groups. A third experiment was conducted in ovariectomized ewes to determine if ingestion of SW altered progesterone clearance. Ewes (8) were assigned to either SW or no SW. Ewes were forced fed SW for 31 d and were pair-fed with control ewes. On d 32, a bolus injection (i.v.) of progesterone (200 ug) was administered and serial blood collection was initiated (via jugular catheter) with the first sample collected 1 min post dosing and continued at 2-min intervals for 20 min and then 5 min intervals through 40 min. Distribution (.61 vs .67±.26 $ng \cdot ml^{-1} \cdot mL^{-1}$) and elimination (.034 vs .036± .006 $ng \cdot min^{-1} \cdot mL^{-1}$) of progesterone was similar (P>.1) between no SW and SW, respectively. Contrary to our previous work, dietary snakeweed did not influence progesterone concentrations in cattle nor progesterone clearance in ewes.

Key Words: Beef cattle, Sheep, Progesterone, Toxicity

303 Effect of feeding diets containing raw soybeans supplemented with poultry by-product meal on the growth and feed intake of starter pigs. I. R. Seddon and T. K. Smith*, *University of Guelph, Guelph, Ontario, Canada.*

Biogenic amines (such as putrescine, spermidine, and spermine) have diverse roles in cell metabolism and growth. Addition of raw soybeans to starter pig diets causes impaired growth and feed efficiency, partially through alterations in biogenic amine metabolism. The objective of this study was to determine the effect of adding poultry by-product meal (PM), a feed ingredient rich in biogenic amines, to starter pig diets containing raw soybeans. Growing pigs, initial weight 10.8 kg, were fed diets containing 0, 5 ,10 or 15% raw soybeans with either 0 or 15% PM for 21 days. Feed intake, gain/feed ratio, total weight gain, and daily gains decreased linearly ($P < 0.0001$) as the level of raw soybeans in the diets increased. This was observed both for pigs consuming diets with either 0% or 15% PM. Inclusion of PM into diets containing either 10 or 15% raw soybean resulted in reduced feed intakes, body weight gains and gain/feed ratios ($P < 0.0001$) compared to pigs fed similar diets with 0% PM. Feed intake was not reduced by the inclusion of PM into diets containing 5% raw soybeans, however body weight gain and gain/feed ratio were reduced by the inclusion of PM in the 5% raw soybean diets ($P < 0.01$). Diets containing 15% PM and raw soybeans had a 3 fold increase in putrescine concentrations compared to diets containing 0% PM and raw soybeans (45 mg/kg compared to 15 mg/kg) and higher tyramine concentrations (20 mg/kg compared to 0 mg/kg) whereas spermine and spermidine concentrations were similar among all diets. It can be concluded that addition of PM to diets containing raw soybeans caused a greater reduction in performance than raw soybeans alone. The reductions in performance may be related to altered biogenic amine metabolism; possibly due to increased dietary biogenic amine concentrations. (Supported by NSERC and OMAFRA).

Key Words: Pigs, Biogenic Amines, Raw Soybeans

304 Blood and digestive parameters in goats inoculated with dihydroxypyridine (DHP) -degrading bacteria *(Synergistes jonesii).* M. Smuts-Ayers[2]*, R. Puchala[1], and T. Sahlu[1], *[1]E (Kika) de la Garza Institute of Goat Research, Langston, Oklahoma, USA and [2]ARC-Animal Nutrition and Products Institute, Irene, South Africa.*

The objectives of this experiment were to determine the physiological differences between adult Angora goats (n = 5) inoculated (INOC) with the DHP-degrading bacteria (*Synergistes jonesii*) and goats (n = 4) that had not been inoculated (CON), where both groups were consuming a 100% *Leucaena leucocephala* (leucaena) diet *ad libitum*. The INOC group were inoculated with *S. jonesii* bacteria in ruminal fluid obtained from steers grazing leucaena. Ruminal fluid (200 mL/goat) was transferred to each goat via intraruminal infusion. As soon as the establishment of *S. jonesii* was positively confirmed, a digestibility trial was carried out. Blood, urine and ruminal fluid samples were also obtained daily. Five days after *S. jonesii* inoculation, no differences ($P > .05$) were noted in DM digested as a percentage of intake (CON 40.5%; INOC 37.7%; SEM 2.16) or in N retention as a percentage of that digested (CON 90.5%; INOC 91.5%, SEM 2.59) between the two groups. Ruminal propionate levels were higher ($P < .06$) in the INOC group compared to the CON group. This may substantiate claims that DHP is broken down to propionate in the process of detoxification. Plasma glucose (CON 3.11; INOC 3.15 mM), urea-N (CON 15.2; INOC 14.8 mM), NEFA (CON 3530; INOC 3480 mg/L), and total protein (CON 68.1; INOC 66.5 g/L) concentrations were not ($P > .05$) affected by *S. jonesii* inoculation. However, concentrations of NEFA, bilirubin, iron, leukocyte, and enzyme (lactate dehydrogenase, creatine kinase, and gamma glutamyltransferase) concentrations of both the CON and INOC groups were higher than the norm expected for goats. Furthermore, the CON group exhibited insulin, thyroxine, phenylalanine, threonine, hemoglobin, leucocyte, lymphocyte, and packed cell volume concentrations higher ($P < .10$) than those observed for the INOC group. Plasma methionine (12.9 vs. 15.7 μM) concentrations of the CON animals were lower ($P < .05$) than those of the INOC group. These results suggest that DHP may not affect digestive function but instead may disrupt metabolic processes.

Key Words: *Leucaena leucocephala*, *Synergistes jonesii*, Angora goats

305 Blood level bioequivalence of two trenbolone acetate feedlot steer implants. D. C. Kenison[1]*, W. G. Zollers, Jr.[1], G. D. Hindman[1], T. N. TerHune[2], S. L. Gray[3], D. M. Henricks[3], V. N. Taylor[4], and G. A. Milliken[4], *[1]Ivy Laboratories, Overland Park, KS, [2]Health Management Services, Tulare, CA, [3]Clemson University, Clemson, SC, and [4]Milliken Associates, Manhattan, KS.*

Finaplix®-S (FIN) is an anabolic implant for beef cattle containing 140 mg of trenbolone acetate (TBA) which is approved for use in growing-finishing steers to improve feed efficiency. For continued effectiveness in a typical feeding period, FIN should be reimplanted once after 63 days. A study was conducted to determine if a new TBA implant (TBIMP), containing 140 mg TBA, developed in our laboratories, would exhibit blood level bioequivalence with FIN. Ninety-six beef steers (avg. weight = 213 kg) were stratified by initial weight into 48 blocks of two steers. Within each block, steers were randomly divided among two treatments: 1) FIN or 2) TBIMP, implanted on Day 0 and 63. Implants were placed in the middle third of the ear according to label directions. Steers were housed in a single pen at a study site in the San Joaquin Valley of California and fed a typical growing-finishing ration for 154 days. Serum samples were collected by jugular venipuncture on Days -2, -1, 0 to establish baseline levels of trenbolone-17β(TB), the active metabolite of TBA. From Day 63 to 154, jugular serum samples were collected at various intervals for measurement of TB levels by radioimmunoassay. Cattle were weighed on Day 0, 63, and 154 to monitor weight gains. Study cattle average daily gains, across both treatment groups, were 1.58, 1.18 and 1.35 kg/d for Day 0-63, 63-153 and 0-154, respectively. Determination of bioequivalence for TBIMP to FIN was based on TB serum level calculations. Values for natural log of area under the curve (LAUC) and maximum concentration (LCMAX) were calculated using means of individual steer sample time replicate analyses. Least square means for LAUC of TBIMP and FIN groups were 9.818 (SE=0.0432) and 9.834 (SE=0.0428) and for LCMAX were 6.746 (SE=0.0498) and 6.752 (SE=0.0493), respectively. Confidence intervals were computed as described in the CVM Bioequivalence Guideline (4/12/90) and Statistical Procedures for Bioequivalence Studies Using a Standard Two-Treatment Crossover Design (6/26/92). The results of these analyses indicated that TBIMP and Finaplix®-S were bioequivalent.

Key Words: Beef Cattle, Trenbolone Acetate, Implant