W150 Immunosterilization of bitches with an anti-LHRH vaccine using CpG ODN as an adjuvant. R. Zanella[1], M. Ragagnin de Lima*[4], J. J. Reeves[1], V. Conforti[2], D. DeAvila[1], A Ferreira Marques[4], S. A. Messina[1], R Bogden[3], and E. L. Zanella[4], [1]*Washington State University*, *Pullman*, [2]*Cincinnati Zoo & Botanical Garden*, *Cincinnati, OH*, [3]*Amplicon Express*, *Pullman, WA*, [4]*Universidade de Passo Fundo*, *Passo Fundo, RS, Brazil*.

There are around 400 million street dogs in the world (WSPA), generating serious sanitary and welfare problems. Currently,contraceptive methods used in dogs are surgical spaying or neutering procedures or hormone treatments. However, the surgical methods are irreversible, and hormone treatments can cause undesirable side effects. Immunosterilization using an anti-LHRH vaccine has been tested in cattle, goats, and sheep, resulting in reproductive sterilization. Luteanizing hormone-releasing hormone (LHRH) immunization causes reproductive sterilization by disrupting the hypothalamic-pituitary-gonadal axis through immunoneutralization of LHRH. The objective of this study was to evaluate the effect of LHRH immunization with cytosine guanine oligodeoxynucleotide (CpG ODN 2006) as an immunostimulant in female dogs. Fourteen (n = 14) healthy, adult female dogs were used. Animals were randomly assigned in two treatment groups (n = 7 dogs/group): A) two injections of ova-LHRH with CPG ODN, 50 d apart (1 mg total dose); B) two injections of CpG ODN, 50 d apart (negative control). The effect of the vaccine was evaluated by comparing the proportions of females that showed estrous behavior and became pregnant. Four months after immunization, all dogs in group A and B that presented estrous behavior were bred. In Group B, 4 dogs displayed estrous behavior and became pregnant delivering 20 puppies. In Group A, one dog (out of 2 that displayed estrous) became pregnant with 3 puppies. The t-test result showed a difference between puppies born/treatment ($P < 0.02$). Although this vaccine was not 100% efficient in preventing pregnancy, our results suggest that LHRH immunization with CpG ODN reduced estrous activity and fertility rates in female dogs.

Key Words: LHRH Vaccine, Immunosterilization in Dogs, CpG ODN

W151 Ovarian follicular dynamics during the interovulatory interval in Najdi goats. H. Kohram*[1,2], S. Gooraninejad[2], A. Motaghedi[2], G. Mohammadi[2], and E. Dirandeh[1], [1]*Tehran University*, *Karaj, Tehran, Iran*, [2]*Shahid Chamran University*, *Ahvaz, Khoozestan, Iran*.

The purpose of the present study was to characterize follicular dynamics during the estrous cycle in najdi goats. Najdi goats (n = 5) were synchronized with 2 im injections of prostaglandin F2a given 11 d apart (estrus = d 0). Ovarian follicular development was monitored daily by real-time ultrasonography using a B-mode instrument with a 7 MHz linear-array transducer. The mean (±SEM) interovulatory interval for the five najdi goats was 20.6 ± 0.9 d. The follicular patterns included either four (n = 2) or five (n = 3) follicular waves per cycle and the mean number of follicular waves in najdi goats was 4.6 ± 0.5. The mean (±SEM) diameters of the largest follicles were 5.6 ± 0.8, 5.6 ± 0.5, 6.0 ± 1.7, 7.0 ± 1.8, and 5.2 ± 0.4 for first through fifth follicular waves, respectively. The mean (±SEM) appearance day of follicular wave was -0.8 ± 1.1 (n = 5); 3.2 ± 0.4 (n = 5); 7.0 ± 0.6 (n = 5); 12.3 ± 1.7 (n = 5); and 13.0 ± 1.6 (n = 3) for first to fifth follicular waves, respectively (n = number of goats). Dominant follicles reached their maximum diameter on d 2.9 ± 1.5, 7.6 ± 0.6, 12.2 ±1.4, 16.7 ± 2.1, and 18.6 ± 0.5 of the estrous cycle and the intervals from follicular wave emergence to dominant follicle maximum diameter were 4.3 ± 1.6, 4.2 ± 1.3, 4.3 ± 1.4, 4.3 ± 1.4, and 4.4 ± 1.4 d for first through fifth follicular waves, respectively. During the fourth and fifth follicular waves the maximum diameters of the dominant follicles were 7.7 ± 0.8 and 5.2 ± 0.4, respectively. Najdi goats ovulated in average 1.8 ± 0.4 follicles per estrous cycle. Our results suggest that follicular growth in najdi goats is a dynamic process, and the development of ≥$2 mm follicles occurs in waves. However, during each wave a single follicle becomes dominant whereas other follicles in the same wave regress.

Key Words: Goats, Follicles, Real-Time Ultrasonography

W152 Alteration of ovarian follicular dynamics by GnRH in water buffaloes. H. Kohram*[1,2], G. Mohammadi[2], and E. Dirandeh[1], [1]*Tehran University*, *Karaj, Tehran, Iran*, [2]*Shahid Chamran University*, *Ahvaz, Khoozestan, Iran*.

The objective of the present study was to evaluate the ovarian response of buffalos to GnRH injections given at different moments of the estrous cycle. The estrous cycles of 15 buffaloes were synchronized with 2 im injections of prostaglandin F2a ± given 11 d apart. The buffalos were randomly assigned to 1 of 3 treatments. Buffalos in the control treatment received no treatment, whereas G6 buffalos received a GnRH injection between d 5 and 7 and G16 buffalos received a GnRH injection between d 15 and 17 of the estrous cycle (estrus = d 0). Daily, from estrous cycle d 0 to the next estrous cycle d 23, cows had their ovaries scanned by ultrasound. All follicles were classified in to 4 to 6 mm, and ≥7 mm follicles. Data were analyzed using the GLM procedure of SAS. In the three treatments, the number of 4 to 6 mm follicles had a declining trend from d 1 and reached their smallest amount on d 4 and 5 ($P<0.05$). Thereafter, the number of this class of follicles in the control, G6 and G16 treatments increased until d 8, 10 and 6, respectively ($P<0.05$). In response to an injection of GnRH, the number of small follicles in treatment G6 and G16 increased on d 9 and 18, respectively. Again, the number of small follicles increased in the control and G6 treatments from d 15 and 19, respectively, to d 21 of the estrous cycle. The number of ≥7 mm follicles had an increase ($P<0.05$) until d 3 in the control and d 5 in the G6 and G16 treatments. In the G6 treatment of buffaloes, GnRH injection on d 6 increased ($P<0.05$) the number of large follicles on d 10. The number of ≥7 mm follicles in the two treatments (control and G6) increased between d 17 and 19 of the estrous cycle. An increase the number of small and medium sized follicles 2 d after GnRH injection showed that an injection of GnRH at the beginning or later days of the estrous cycle could promote the emergence of a new follicular wave in buffaloes.

Key Words: Buffaloes, Follicles, Real-Time Ultrasonography

W153 Effects of oral doses of colostrum on luteal regression and synchronization of estrus in dairy heifers. S. L. McKee*, S. P. Washburn, and C. S. Whisnant, *North Carolina State University*, *Raleigh*.

A 1984 study indicated an effect of 900 ml of oral colostrum on lowering milk progesterone (P4) in cattle, presumably due to estrogens and prostaglandin metabolites in colostrum. The objective of this experiment was to examine responses of cyclic dairy heifers to oral colostrum in comparison to untreated heifers or those receiving prostaglandin F2α(PGF). The pooled, frozen–thawed colostrum used was either high (≈6 L) or medium (≈18 L) quality based on a colostrometer (Biogenics–Mapleton, OR). Heifers (n = 29) were Holsteins, Jerseys, or crossbreds of both breeds with mean BW = 287± 11 kg. A corpus luteum (CL) was identified for each heifer with use of ultrasound; average CL diameter = 2.9±0.1 cm. Heifers were assigned at random to 1 of 4 treatment groups: T1 –untreated control (n = 7); T2–positive control, 25 mg PGF i.m. (n = 7); T3–1 L oral colostrum (n = 7); or T4 –2 L oral colostrum (n = 8). Colostrum was administered using an esophageal tube and pump. Ultrasound measurements and blood samples were collected before treatment, and 1 and 4 d after treatment to determine changes in CL size and serum P4 concentrations. Heifers received tailhead paint and were observed for estrus twice daily. All 7 heifers receiving PGF (T2) came into estrus within 4 d after treatment (2.8 ±0.2 d) whereas only 3 heifers from T1, 2 heifers from T3, and 3 heifers from T4 were detected in estrus within 6 d after treatment. All heifers detected in estrus had P4≥2.0 ng/ml at treatment which declined after treatment. In contrast, the 14 heifers not observed in estrus by 6 d had concentrations of P4≥2.0 ng/ml at treatment and 1 and 4 d after treatment. All PGF–treated heifers responded with a decline in P4 and subsequent estrus whereas responses among the 15 heifers that received colostrum were similar to the 7 untreated heifers. This trial does not support the hypothesis that oral doses of 1 to 2 L of colostrum enhance luteal regression. It is not known whether use of colostrum of higher quality or at higher doses would be more effective.

Key Words: Colostrum, Synchronization, Heifers

W154 Plasma progesterone concentrations determined by commercial radioimmunoassay kit as puberty criteria for Brahman-crossbred heifers. R. F. Cooke*[1,2], B. R. Austin[2], and J. D. Arthington[1], [1]*University of Florida - IFAS, Range Cattle Research and Education Center*, *Ona*, [2]*University of Florida - IFAS, Animal Sciences*, *Gainesville*.

Concentrations of plasma progesterone (P4) greater than 1.0 ng/mL are often used as puberty criteria for beef heifers. Prepubertal Brahman-crossbred heifers may have P4 concentrations above this level, decreasing the accuracy of puberty determination in heifer development studies. The objective of this experiment was to evaluate three different plasma P4 concentrations (1.0, 1.5 or 2.0 ng/mL) as puberty criteria for Brahman-crossbred heifers. A total of 960 blood samples were collected, concurrently with assessment of ovarian luteal tissue via trans-rectal ultrasonography, from 37 Braford and 43 Brahman × Angus heifers. Plasma samples were analyzed for P4 concentrations using a Coat-A-Count Kit (DPC Diagnostic Products Inc., Los Angeles, CA) solid phase ^{125}I RIA. Puberty was determined by detection of ovarian luteal tissue and elevated plasma P4 concentrations. Only data from prepubertal heifers were evaluated (630 of 960). Data were analyzed using the GLM procedure of SAS. A puberty criteria × breed interaction was detected ($P < 0.05$). Increasing puberty criteria from 1.0 to 1.5 ng/mL decreased ($P < 0.01$) the incidence of false positives in Brahman × Angus heifers; approximately 15 % (41 of 265) of false positives were detected for 1.0 ng/mL, 6% (17 of 265) of false positives were detected for 1.5 ng/mL, and 4% (10 of 265) of false positives were detected for 2.0 ng/mL. Increasing puberty criteria from 1.0 to 1.5 or 2.0 ng/mL decreased ($P < 0.01$) the incidence of false positives in Braford heifers; approximately 33% (121 of 365) of false positives were detected for 1.0 ng/mL, 18% (65 of 365) of false positives were detected for 1.5 ng/mL, and 10% (37 of 365) of false positives were detected for 2.0 ng/mL. In conclusion, the adoption of 1.5 and 2.0 ng/mL of plasma P4 concentrations as puberty criteria for Brahman × Angus and Braford heifers, respectively, decreased the incidence of false positives and appear to be appropriate for assessment of puberty in heifer development studies using these types of cattle.

Key Words: Brahman-Crossbred Heifers, Progesterone, Puberty Criteria

W155 Progesterone concentration during follicular development affects follicular fluid composition and uterine release of PGF2a in dairy cows. R. L. A. Cerri*[1,2], F. Rivera[2], C. D. Narciso[2], R. A. Oliveira[2], R. C. Chebel[2], M. A. Amstalden[3], W. W. Thatcher[1], and J. E. P. Santos[1], [1]*University of Florida*, *Gainesville*, [2]*University of California*, *Tulare*, [3]*Texas A&M University*, *College Station*.

Two experiments evaluated the influence of progesterone (P4) concentrations on follicular fluid content and circulating prostaglandin (PG) F metabolite (PGFM). Cows were pre-synchronized and then assigned to 1 of 2 synchronization protocols on d 7 of the estrous cycle: high progesterone (HP): modified Ovsynch (GnRH+CIDR, 7 d PG+CIDR removal, 2 d GnRH); and low progesterone (LP), similar to HP, but with additional PG injections on d 2, 2.5 and 3 of estrous cycle preceding the Ovsynch, and on d 0, 2, 2.5 and 3 relative to the first GnRH of the Ovsynch. Ovaries were evaluated by ultrasonography, and blood analyzed for concentrations of P4 and estradiol (E2). In experiment 1 (Exp 1; n = 20), blood was analyzed for LH concentrations every 15 min for 3 h on d 5 of the Ovsynch. The dominant follicle (DF) was aspirated 48 h after PG and the follicular fluid (FF) analyzed for P4, E2, and free and total IGF-1. In experiment 2 (Exp 2; n = 26), follicular development, and P4 and E2 concentrations were measured until d 16 after the Ovsynch, when cows were challenged with estradiol/oxytocin and PGFM measured. In Exp 1 and Exp 2, HP cows had less plasma E2 and greater P4 (P<0.001) and smaller (P=0.005) DF diameter during the Ovsynch than LP. In Exp 1, concentration of LH tended (P=0.10) to be less for HP than LP (0.79 vs. 0.93 ng/mL). Concentrations of P4 in the FF were similar, but HP had less (P=0.005) E2 than LP (330.9 vs. 387.5 ng/mL). Free IGF-1 was similar (P=0.15) for HP and LP (5.23 vs. 3.53 ng/mL), but total IGF-1 was greater (P=0.02) for HP than LP (51.7 vs. 40.8 ng/mL). In Exp 2, plasma concentrations of E2 and P4 did not differ (P=0.34) between treatments after the Ovsynch. Proportion of cows with a short luteal phase was less for HP (0%) than LP (25%). Concentrations of PGFM were less (P<0.05) for HP than LP at 90 and 120 min after the oxytocin challenge. Reduced P4 concentrations during Ovsynch altered follicular dynamics, FF composition and E2 concentrations, and exacerbated PG release in the subsequent estrous cycle when plasma P4 and E2 were comparable between treatments.

Key Words: Dairy Cow, Progesterone, Prostaglandin

W156 Evidence that the diminished production of progesterone during estrous cycles of cattle with a low antral follicle count during follicular waves is repeatable and not caused by alterations in size of the corpus luteum. F. Jimenez-Krassel*[1], J. K. Folger[1], G. W. Smith[1], P. Lonergan[2], A. C. O. Evans[2], and J. J. Ireland[1], [1]*Michigan State University*, *East Lansing*, [2]*University College Dublin*, *Dublin, Ireland*.

The mechanisms that regulate the variation in progesterone (P) production in animals, which may contribute to infertility, are poorly understood. Previous results demonstrate that cattle can be phenotyped reliably based on antral follicle count (AFC) during ovarian follicular waves, and that cattle of similar ages with low versus high AFC not only have a diminished ovarian reserve (number of healthy eggs) and higher FSH concentrations, but lower serum P concentrations during estrous cycles. Based on these observations, animals with a low AFC are hypothesized to have smaller corpora lutea (CL) which have a correspondingly reduced capacity to produce progesterone during consecutive estrous cycles. To test this hypothesis, beef heifers (10-12 mo; 392 ± 14 kg) with low (≤15 follicles > 3 mm in diameter) or high (>25 follicles) AFC during follicular waves were identified and synchronized with two injections of prostaglandin F2α (PG) spaced 11-d apart. After the second PG injection, blood samples were collected daily until 14 d after ovulation. This estrus synchronization and blood sampling regimen was repeated three times during three different estrous cycles. CL size was measured by daily ultrasonography during the second estrous cycle. Although P concentrations were similar within groups during each estrous cycle, P was much higher ($P<0.05$) from Day 3 to 14 and increased at a greater rate ($P<0.05$) after ovulation during each of three consecutive estrous cycles for animals with a high versus low AFC. However, CL size did not differ ($P>0.1$) between groups. Taken together, these results indicate that despite similarity in CL size, the capacity of the CL to produce P is diminished during several different estrous cycles for animals with relatively low versus high AFC. Whether the low circulating progesterone concentrations cause or contribute to infertility in cattle with low AFC during follicular waves and correspondingly low ovarian reserve is unknown. Project supported by NRI Competitive Grant no. 2007-35203-18178 from the USDA-CSREES to JJI.

Key Words: Progesterone, Corpus Luteum, Follicles

W157 Protocols using progesterone intravaginal device for lactating Holstein cows. R. M. Santos*[1], D. G. B. Demétrio[2], J. L. M. Vasconcelos[2], B. L. Cardoso[2], F. M. Abreu[2], L. H. Cruppe[2], and S. Soriano[3], [1]*EAFUDI*, *Uberlândia*, [2]*FMVZ-UNESP*, *Botucatu*, [3]*Fazenda Colorado*, *Araras, Brazil*.

Studies in Brazil with dairy cows maintained on pasture, show that the protocol using an estradiol benzoate (EB) plus progesterone intravaginal device for 9 d results in a higher synchronization rate than the Heatsynch protocol. The objective of this study was to evaluate ovulation and conception of high producing cows maintained in a free stall barn treated with 2 different protocols. Lactating Holstein cows (n = 637) producing 37.9±9.64 kg milk/d and with 178.1±150 DIM, were randomly assigned to receive one of 3 treatments: Group 1 (n = 270): cows received AI 12 h after estrous detection; Group 2 (Heatsynch; n = 248): CIDR insertion (CIDR® 1.9 mg Pfizer) + GnRH (1 mL Fertagyl® Intervet) - 7 days - CIDR removed + PGF2α (5 mL Lutalyse® Pfizer) - 24h - Estradiol Cypionate (0.5 mL ECP® Pfizer), and Group 3 (n = 119): CIDR insertion + EB (2 mL Estrogin® Farmavet) - 7 days - PGF2α (5 mL Lutalyse®) + 2 days - CIDR removed + Estradiol Cypionate (0.5 mL ECP®). Cows that showed heat received AI 12 h later and the remaining were TAI 48 h after the ECP injection. Presence of CL at d 7 (ovulation rate) and pregnancy 28 d after AI were evaluated by ultrasound. The variables ovulation, conception of all cows and ovulated cows were analyzed by the logistic model to evaluate the influence of the covariates (DIM, milk yield, parity, and treatment) on the probability of success. The ovulation rate was not affected by treatment (G1=92.2; G2=92.7; G3=87.4%), but was negatively affected by parity ($P<0.05$) and DIM ($P<0.01$). The conception rate of all cows (G1=22.6; G2=30.2; G3=19.3%) and ovulated cows (G1=24.5; G2=32.6; G3=22.1%) was affected by treatment ($P<0.05$) and DIM ($P<0.05$). These results show that the protocol Heatsynch can increase conception in lactating dairy cows. This result is probably because the development of the ovulatory follicle occurs in higher progesterone concentration, due to formation of corpus luteum after GnRH injection, since no difference in ovulation rate was observed.

Key Words: Synchronization, Conception, Dairy Cows

W158 Effects of high vs. low progesterone concentrations during Ovsynch on double ovulation rate and pregnancies per AI in high producing dairy cows. A. P. Cunha*, J. N. Guenther, M. J. Maroney, J. O. Giordano, A. B. Nascimento, S. Bas, H. Ayres, and M. C. Wiltbank, *University of Wisconsin*, *Madison*.

The aim of this study was to evaluate if starting Ovsynch in a low progesterone (P4) environment (Short group) vs. a high P4 environment (Long group) would alter double/multiple ovulation rates (DOV) and pregnancies/AI (P/AI) in high producing dairy cows. Holstein cows (n = 514) from 2 different dairy farms were assigned to two groups in a CRD design. Cows were presynchronized before the breeding Ovsynch with an Ovsynch72 protocol (GnRH–7d–PGF–3d–GnRH) but no TAI was performed. This presynchronization Ovsynch allowed initiation of the breeding Ovsynch on a known day of the cycle. Cows then began Ovsynch immediately (the 2nd GnRH of the Ovsynch72 was the 1st GnRH of the breeding Ovsynch) (Short; n = 259) or cows received the 1st GnRH of the breeding Ovsynch 1 wk later (Long; n = 255). Ovarian ultrasound and blood samples were performed in order to assess ovulation, pregnancy diagnosis, and circulating P4 concentrations. As expected, cows in the Long had much higher P4 than cows in the Short at the 1st GnRH of the breeding Ovsynch (1.84ng/mL vs 0.28ng/mL) and higher P4 at the PGF treatment (4.40ng/mL vs 2.23ng/mL). Long and Short groups showed similar ovulation rate to the last GnRH of the breeding Ovsynch (94.5% vs 95.1%). The DOV was much greater in Short than Long (21.0% vs 7.1%; $P<0.05$). Overall P/AI (at Day 29 pregnancy diagnosis) was much greater in Long than Short (48.2%, n=255 vs 33.2%, n = 259; $P<0.01$). Surprisingly, pregnancy loss (between d 29 to 57) was also less in Long than Short (4.3% vs 15.6%; $P<0.05$). Thus, high P4 (Long protocol) during follicle development dramatically reduces selection of co-dominant follicles reducing double ovulation rate. In spite of ovulating fewer follicles, cows treated with the long protocol had better fertility than the Short providing strong evidence for the importance of high P4 during Ovsynch. Thus, the Long protocol may both reduce twinning rate and increase fertility during timed AI.

Key Words: Conception Rate, Fertility

W159 Effect of the third use of CIDRs on the pregnancy rate of beef cattle. W. A. Greene* and M. L. Borger, *The Ohio State University*, *Wooster, OH*.

The objective of this study was to determine the effect of the third use of intra-vaginal progesterone inserts (CIDRs), as a part of a synchronization program, on pregnancy rates (PR) in beef cattle. One hundred and twenty-two animals were allotted to two similar groups, new CIDR (N) and used CIDR (U), based upon breed, age, postpartum interval, and postpartum cyclicity (as determined by ultrasonography). All cattle received 100 μg GnRH im on d 0. Also on d 0, cattle in the N group received a new CIDR, containing 1.38 g progesterone, while U group cattle received a CIDR previously used for two 7 d periods. On d 7, jugular blood samples were collected for plasma progesterone (P4) analyses, CIDRs were removed, and all animals received 25 mg $PGF_{2\alpha}$ im. Each removed CIDR was evaluated for signs of vaginal infection and scored from 1 to 5 (1 = clear, 5 = heavy pus). Animals were observed for estrus 0700 and 1900 and were bred by AI 11 - 13 h after estrus was observed. If estrus was not observed, animals were timed AI and received 100 μg GnRH im 70 - 72 h after $PGF_{2\alpha}$. Following the synchronization period, repeat breedings were done until d 60. Cows were pregnancy diagnosed by ultrasonography on d 88. N and U groups had similar ($P > 0.05$) estrus detection rates [EDR] (59.0 and 62.3%). The N group had higher ($P < 0.05$) PR to synchronization (54.1 vs. 31.2%) and overall PR (91.8 vs. 73.8%) than the U group. Cycling (n = 86) and anestrous animals had similar ($P > 0.05$) EDR (66.3 and 47.2%), PR to synchronization (44.2 and 38.9%), and overall PR (87.2 and 72.2%). Cattle with high vaginal scores (4 & 5, n = 90) and low vaginal scores (1, 2, and 3) had similar ($P > 0.05$) PR to synchronization (43.3 and 38.7%) and overall PR (82.2 and 83.9%). The rates of high vaginal scores were similar ($P > 0.05$) for the N and U groups (78.3 and 70.5%). Mean P4 levels (ng/ml) at CIDR removal were similar ($P > 0.05$) for N (1.1 ± 0.8) and U (1.1 ± 1.1) cattle. The third use of CIDRs in a beef cattle synchronization program resulted in lower pregnancy rates than the use of new CIDRs.

Key Words: Synchronization, CIDR Reuse, Progesterone

W160 Effect of the timing of CIDR insertion on the GnRH-induced LH surge and ovulatory response. G. A. Perry* and B. L. Perry, *South Dakota State University*, *Brookings*.

Elevated concentrations of progesterone have been reported to reduce the magnitude of a GnRH-induced LH surge, and GnRH is frequently used to induce ovulation and synchronize a follicular wave at the start of estrous synchronization protocols. Therefore, the objective of this study was to determine the effect of elevated concentrations of progesterone, from a CIDR, on the GnRH-induced LH surge and ovulatory response. Angus cross beef heifers (n = 112) were assigned to one of three treatments. Heifers received an injection of GnRH: 1) at CIDR insertion (CIDR-0), 2) 6 h before CIDR insertion (CIDR-6), or 3) 48 h after CIDR insertion (CIDR+48). Follicle size was determined prior to GnRH, and ovulatory response (follicle disappearance) was determined 2 d later. Blood samples were collected from a subset of heifers (n = 60) at 0, 30, 60, 90, 120, 150, 180, 210, 240, 300, and 360 min after GnRH. At time of GnRH, heifers that had initiated estrous cycles had greater ($P<0.02$) concentrations of progesterone compared to peripubertal heifers, and CIDR+48 (3.3 ± 0.6 ng/mL) had greater ($P<0.01$) concentrations of progesterone compared to CIDR-0 (1.2 ± 0.6 ng/mL) and tended ($P=0.1$) to be greater than CIDR-6 (1.9 ± 0.7 ng/mL) heifers. There was no effect ($P=0.2$) of cycling status on induction of ovulation (29/41 and 42/72 for peripubertal and cycling). Ovulation was induced in more ($P<0.05$) CIDR-0 (26/38) and CIDR-6 (28/37) heifers compared to CIDR+48 (17/38) heifers. There was no influence ($P=0.19$) of treatment on concentrations of LH during the GnRH-induced LH surge, but there was an effect ($P<0.01$) of progesterone. Heifers having elevated concentrations of progesterone at time of GnRH had a reduced LH surge compared to heifers with decreased concentrations of progesterone. However, there was no difference ($P=0.11$) in the magnitude of the LH surge between heifers that did and did not ovulate. In summary, elevated concentrations of progesterone at time of GnRH decreased the GnRH-induced LH surge, but there was no difference in the magnitude of the LH surge between heifers that did or did not ovulate.

Key Words: Heifer, Ovulation, LH

W161 Ovarian activity and response to estrus synchronization with CIDR, β-estradiol and $PGF_{2\propto}$ in Creole Rodeo compared to Hereford cows. J. A. Ramírez-Godínez*, J. P. Zárate-Martínez, F. A. Rodríguez-Almeida, and A. Flores Mariñelarena, *Universidad Autonoma de Chihuahua*, *Chihuahua, Chihuahua, Mexico*.

The objective was to compare ovarian activity, serum progesterone (P_4) concentrations and conception rates of Creole rodeo (Cr) and Hereford (HE) cows, synchronized and AI′ed 12 h after estrus initiation. The Cr (n = 8) and HE (n = 10) cows received a CIDR (1.9 g of P_4) and 1 mg of β-estradiol (d 0). On d 7, the CIDR was removed and 30 mg of $PGF_{2\propto}$ were administered. On d 8, 1 mg of β-estradiol was injected. The anovulatory estrous rate (AOR), follicular waves number (FWN) and conception rate (CR) were analyzed with PROC FREQ of SAS. The time from CIDR removal to estrus (TE) was analyzed using PROC GLM, with breed (B) as a fixed effect. Diameter of the dominant follicle (DF) and corpus luteum (DCL), and P_4 were analyzed using PROC MIXED of SAS, with B, day (D)and their interaction as fixed effects and cow within B as a random effect. The Cr had a greater ($P<0.05$) AOR (62.5%) compared to HE (30%) cows. The TE was greater ($P<0.05$) in Cr (40.17±1.06 h) than in HE (31.68±0.95 h) cows. In both breeds a relationship between AOR and FWN was observed. At a greater FWN a graeter AOR (44.4 %) was found ($P<0.05$). A B by D interaction was observed ($P<0.01$) for P_4. The Cr cows had increased P_4 (4.36±0.30 ng/mL) during the synchronization period than HE (2.30±0.31 ng/mL); however, during the luteal phase after the synchronized estrus, Cr had decreased ($P<0.01$) P_4 (0.96±0.13 ng/mL) than HE (1.8±0.16ng/mL) cows. The DF and DCL were smaller ($P<0.01$) in Cr vs HE (1.32±0.08 vs 1.67±0.07 cm and 3.07±O.17 cm vs 3.6±0.15 cm, respectively). The conception rate was decreased ($P<0.05$) in Cr (25%) vs HE (60%) cows. We concluded that Creole rodeo cows showed a greater incidence of anovulatory estrous than Hereford cows, which could be the cause of reduced fertility.

Key Words: Creole Cows, Synchronization, Ovarian Activity

W162 Effect of progestin treatment on formation of persistent follicles in postpartum beef cows. M. E. Risley*, J. A. Atkins, and M. F. Smith, *University of Missouri*, *Columbia*.

Progestins (melengestrol acetate [MGA] and Controlled Internal Drug Release [CIDR] inserts) are frequently used to effectively control estrus

and ovulation in beef cattle. Treatment of cycling cows with MGA for 14 d, in the absence of a corpus luteum, induces formation of persistent follicles and a corresponding reduction in fertility. The objective was to determine if the presence of a new or used CIDR in postpartum cows, without a corpus luteum, would induce the formation of persistent follicles and to compare serum concentrations of progesterone (P4) in cows treated with a new or used CIDR to luteal phase concentrations of P4 in non-treated cows. Normally cycling cows were blocked by days postpartum, age and body condition score and allocated into the following treatment groups: Control (n = 10), MGA (n = 11; 0.23 kg $^{-1}$hd^{-1}day), new CIDR (n = 9; 1.38 g P4), and used CIDR (n = 9; new CIDR previously inserted into cows for 7 d and subsequently stored for approximately six months). Groups were presynchronized with a CIDR for 7 d, prostaglandin $F_{2\alpha}$ (PGF) on d 6 and GnRH 48 hr after CIDR removal. Progestin treatment began on d 4 post-estrus and $PGF_{2\alpha}$ was injected on d 6 to induce luteolysis (d 0 = estrus). MGA or CIDR treatment continued for 14 d and length of a follicular wave was defined as the interval from follicular recruitment to ovulation or initiation of a new wave. Length of the first follicular wave (d) was 10.7^{a}, 15.6^{b}, 15.4^{b}, and 13.2^{b} ($^{ab}P = 0.07$) and maximum diameter (mm) of the dominant follicle was 14.1^{a}, 17.3^{b}, 16.7^{b}, and 16.1^{b} ($^{ab}P < 0.08$) in the Control, MGA, new CIDR, and used CIDR groups, respectively. Maximum diameter of the dominant follicle was similar ($P > 0.1$) in the used CIDR, new CIDR, and MGA groups. Serum concentrations of P4 in the new and used CIDR groups were similar ($P > 0.1$) throughout the 14 d treatment period but lower than in the control group. In summary, treatment with a new or used CIDR induced formation of persistent follicles in postpartum beef cows and serum concentrations of P4 were similar between the two CIDR groups.

Key Words: Progesterone, Persistent Follicle, Beef Cows

W163 Effect of duration of CIDR exposure on reproductive performance of beef heifers using a CIDR-based timed-AI protocol. A. Ahmadzadeh*[1], D. Gunn[2], and B. Glaze[3], [1]*University of Idaho*, *Moscow*, [2]*University of Idaho Extension*, *Fort Hall*, [3]*University of Idaho Extension*, *Twin Falls*.

The objective of this experiment was to determine the effect of reducing the length of CIDR exposure in a CIDR-based timed-AI protocol (CIDR-PGF2α-GnRH and AI) on conception and pregnancy rates in beef heifers. The experiment was conducted in two years using 152 heifers. In Year 1, British cross-bred heifers (n = 82) were stratified by body weight (BW), body condition score (BCS) and age; and were randomly subjected to one of the two Treatments: 1) heifers (n = 41) received CIDR (d -7) for 7 d, PGF2α(25 mg) at CIDR removal (d 0), GnRH (75 ug) 56 h after CIDR removal and immediate AI (d 3; 7-d CPG); or 2) heifers (n = 41) received CIDR (d -5) for 5 d, PGF2α (25 mg) at CIDR removal (d 0), GnRH (75 ug) 56 h after CIDR removal and immediate AI (d 3; 5-d CPG). In Year 2, 70 heifers were used. The experimental protocol was the same as in Year 1. Heifers were assigned to 7-d CPG (n = 35) or 5-d CPG (n = 35). Estrual behavior was monitored for three d following CIDR removal. Blood samples were collected on the day of CIDR insertion and at breeding (d 3). Heifers were exposed to bulls 14 d after AI. Pregnancy status was determined by ultrasonography at d 32 and 82 after AI. Data were analyzed by logistic regression. Percentage of heifers detected in estrus was different between Years (44% vs. 69 % for Year 1 and 2, respectively) but not different between treatments. Based on progesterone results, the synchronization rates were similar between treatments. However, at experiment initiation fewer animals were cyclic in Year 1 compared with Year 2. There was a Treatment by Year interaction effect on conception to AI ($P < 0.05$). For 7-d CPG and 5-d CPG, in Year 1 conception to AI was 39% and 65.8 %; whereas in Year 2 conception to AI was 64.7% and 41%. Age tended to effect conception to AI ($P = 0.07$), whereas BW and BCS did not affect conception to AI. Overall pregnancy rate was not different between groups (93.4%). The yearly results from this study are inconsistent regarding the effect of reducing the length of CIDR treatment (5-d vs. 7-d) on conception to AI and thus, further research is warranted.

Key Words: Beef Heifers, CIDR, Timed-AI

W164 A field trial comparison of first service conception rates of Ovsynch–56 and CO–Synch–72 protocol in lactating dairy cattle. R. L. Nebel*[1], J. M. DeJarnette[1], M. R. Hershey[2], D. A. Whitlock[2], and C. E. Marshall[1], [1]*Select Sires Inc.*, *Plain City, OH*, [2]*Select Sire Power*, *Rocky Mount, VA*.

This study compared first service conception rates in 3 herds of lactating dairy cows (n = 739) after fixed time AI to one of 2 protocols. All cows received PGF (25 mg, i.m.) on treatment days –35, –21, and 0, GnRH (100 μg, i.m.) on d –7, and fixed time AI at +72 h after the last PGF injection. Within each herd, cows were randomly assigned to receive GnRH at +56 (Ovsynch–56) or +72 h (CO–Synch–72) after the last PGF injection. Data were analyzed in a least square means model including the effects of herd, treatment, parity and all two–way interactions. The mean days postpartum at AI (73 ± 0.1), parity (2.2 ± 0.05), and peak milk yield (kg) per cow (47 ± 0.34) did not differ by treatment. Conception rates were influenced ($P < 0.05$) by the parity by treatment interaction. Among multiparous cows, conception rates were greater ($P < 0.05$) among Ovsych–56 (47%, n = 204) than CO–Synch–72 treated cows (25%, n = 253). Among primiparous cows, the numeric difference in conception rates favored the Ovsych–56 treatment (37%, n = 134) but could not be confirmed as statistically different ($P = 0.33$) than those of the CO–Synch–72 (31%, n = 148) treated cows. No other main effects or interactions were determined to be significant. In conclusion, although difficult to implement in many large herds due to the necessity to handle or lock–up cows at an interval that is not divisible by 24 h, these data indicate that where facilities, labor and management allow for effective implementation the Ovsynch–56 protocol results in greater timed AI conception rates than does the CO–Synch–72 protocol.

Key Words: Timed AI, Ovsynch, Dairy Cows

W165 Effect of supplemental FSH during Ovsynch in high producing Holstein cows. H. Ayres[1,2], R. M. Ferreira[1,2], A. P. Cunha*[1], R. R. Araújo[1], and M. C. Wiltbank[1], [1]*University of Sao Paulo*, *Sao Paulo, Sao Paulo, Brazil*, [2]*University of Wisconsin*, *Madison*.

Programs that allow timed artificial insemination (TAI) have been used to improve reproductive efficiency in dairy herds; however, in many cases pregnancies per AI (P/AI) during these programs remain sub-optimal. Previous research indicated an increase in fertility when beef cattle were supplemented with low doses of FSH (10 or 20 mg) during the latter stages of a timed AI protocol. We hypothesized that treatment with FSH at the time of the prostaglandin F2α (PGF2α) treatment of Ovsynch would increase fertility to the timed AI in dairy cattle. This experiment

was done during the months of June through November 2007 on two commercial dairy farms in south-central Wisconsin. Weekly, a cohort of 35 to 65 cows at 120±73 DIM were stratified by parity and insemination number, and randomly assigned to 1 of 2 treatments: Ovsynch (n = 561) or Ovsynch+FSH (n = 571). All cows received the Ovsynch protocol (GnRH-7d-PGF2α-56h-GnRH-18h-TAI) with prior presynchronization of first service cows and initiation of Resynch at 32d after previous TAI in cows at second or later services. Ovsynch+FSH cows received 20 mg of FSH at the same time as PGF2α. Pregnancy diagnosis was performed 39 d after TAI. Statistical analyses were performed with logistic regression by PROC GLIMMIX of SAS. There were no interactions of treatment with days in milk, parity, insemination number, locomotion score, sire, batch, inseminator, or farm. Therefore, these variables were removed from the statistical model. The overall P/AI were not different between Ovsynch and Ovsynch+FSH [36.2% (203/561) vs. 39.1% (223/571); $P>0.05$)]. Analysis of treatment effects by parity also indicated no difference between Ovsynch vs. Ovsynch+FSH on P/AI in primiparous [41.6% (96/231) vs. 42.0% (103/245); $P>0.05$] or multiparous [32.4% (107/330) vs. 36.8% (120/326); $P>0.05$] cows. Surprisingly, FSH tended to increase P/AI in cows with BCS that was greater than 2.5 [36.5% (148/406) vs. 42.7% (179/419); $P=0.07$] but not in cows with less than 2.5 BCS. Thus, these data do not indicate a major fertility-enhancing effect of a single FSH treatment during Ovsynch in high-producing dairy cows.
(Acknowledgements: Bioniche)

Key Words: FSH, Ovsynch, High Producing Holstein Cows

W166 Administering human chorionic gonadotropin (hCG) 7 d prior to initiating a CO-Synch protocol. C. R. Dahlen*[1], G. Marquezini[2], A. DiCostanzo[2], S. L. Bird[3], and G. C. Lamb[4], [1]*University of Minnesota*, *Crookston*, [2]*University of Minnesota*, *St.Paul*, [3]*University of Minnesota*, *Grand Rapids*, [4]*University of Florida*, *Marianna*.

We determined the effects of administering human chorionic gonadotropin (hCG) 7 d prior to the CO-Synch estrous synchronization protocol on pregnancy rates and concentrations of progesterone in beef cows. Sixty-three suckled (n = 36) and non-suckled (n = 27) cows from 2 locations were stratified by body condition score or days post-partum and randomly assigned to receive one of two treatments: 1) CO-Synch protocol (100 μg injection of GnRH, followed in 7 d by a 25 mg injection of $PGF_{2\alpha}$, followed in 48 hours by insemination and a 100 μg injection of GnRH); CONT, n = 32), or 2) pre-treatment with 1000 IU hCG 7 d prior to the initiation of the CO-Synch protocol (hCG: n = 31). Blood was collected on d -16, -9, -2, 0, 7, and 14 relative to insemination. On d 28 after insemination, transrectal ultrasonography was used to determine presence of a viable fetus. Days post-partum at the time of insemination was greater ($P < 0.05$) for suckled cows at Location 1 (65.8 ± 3.8) compared to Location 2 (23.9 ± 6.2). Pregnancy rates at Location 1 (65.1%; 23/35) were greater ($P < 0.05$) than Location 2 (28.6%; 8/28). However, no differences ($P > 0.05$) in pregnancy rates were detected between CONT (56.3%; 18/32) and hCG (41.9%; 13/31). On d -9, concentrations of progesterone were greater ($P < 0.05$) for cows in the hCG treatment compared to those in the CONT treatment (2.7 ± 0.46 vs 1.4 ± 0.43 ng/ml for hCG and CONT, respectively) No differences ($P > 0.05$) in concentrations of progesterone were present on d -2, 0, 7, or 14 among treatments. We concluded that while pre-treatment with hCG 7 days prior to a CO-Synch protocol appeared not to alter pregnancy rates, it increased concentrations of progesterone at the time of the GnRH injection of the CO-Synch protocol.

Key Words: Human Chorionic Gonadotropin, Beef Cows, Progesterone

W167 Effect of human chorionic gonadotropin (hCG) on ovarian structure dynamics and concentrations of progesterone in cycling Holstein heifers. C. R. Dahlen*[1] and G. C. Lamb[2], [1]*University of Minnesota*, *Crookston*, [2]*University of Florida*, *Marianna*.

We determined the effects of administering hCG on subsequent ovarian structures and concentrations of progesterone in cycling Holstein heifers. In Exp 1, 20 heifers were assigned to receive one of two treatments: 1) 100 μg GnRH im (GnRH; n = 10); and 2) 1000 IU hCG im (hCG; n = 10). All heifers were given 25 mg $PGF_{2\alpha}$ im on d 6 after treatment. Blood collection and ovary examination via transrectal ultrasonography were conducted on d -9, 0, 2, 4, 6, 8, and 10 relative to treatment. In Exp 2, 21 heifers were given 100 μg GnRH im and a CIDR followed in 7 d by 25 mg $PGF_{2\alpha}$ im and CIDR removal. Heifers were scanned via transrectal ultrasonography 40 h after $PGF_{2\alpha}$, stratified by size of dominant follicle, and randomly assigned to receive one of two treatments: 1) 100 μg GnRH im (GnRH; n = 10); and 2) 1000 IU hCG im (hCG; n = 11). Ovarian structures were evaluated and blood was collected on d -9, -2, 0, 7, and 14 relative to treatment. In Exp 1, a greater ($P < 0.05$) proportion of hCG heifers (9 of 10) ovulated in response to treatment compared to GnRH heifers (3 of 10). Subsequently, size of the largest follicle present on either ovary was smaller ($P < 0.05$) for hCG compared to GnRH heifers on d 2 (7.8 ± 1.2 vs 11.5 ± 1.2 mm, respectively), and tended to be smaller ($P = 0.07$) on d 4 (9.6 ± 0.7 vs 11.6 ± 0.7 mm, respectively) after treatment. In Exp 2, volume of luteal tissue on d 7 was greater ($P < 0.05$) in hCG heifers (5.4 ± 0.6 cm3) compared to GnRH heifers (3.4 ± 0.6 cm3). However, no differences were present on d 14 after treatment. No differences in concentrations of progesterone were present after treatment in either experiment. We conclude that hCG was superior to GnRH in its ability to ovulate follicles and increased volume of luteal tissue present 7 d after treatment in heifers previously synchronized, but had no effect on concentrations of progesterone.

Key Words: Human Chorionic Gonadotropin, Holstein Heifers, Ovulation

W168 Factors affecting ovulatory follicle size following follicular wave synchrony in beef heifers. J. A. Atkins, C. L. Johnson*, and M. F. Smith, *University of Missouri*, *Columbia*.

GnRH-induced ovulation of small dominant follicles (<11 mm) resulted in decreased pregnancy rates compared to larger follicles following the CO-Synch fixed-time insemination protocol (GnRH-1 on d -9, $PGF_{2\alpha}$ on d -2, and GnRH-2 plus insemination on d 0) in beef heifers. Factors contributing to the presence of small dominant follicles at insemination following the CO-Synch protocol have not been determined. Failure to synchronize a follicular wave following GnRH-1 seemed a likely hypothesis; however, ovulatory response to GnRH-1 had no effect on ovulatory follicle size at GnRH-2 in beef heifers (Atkins et al., 2008).

The objective was to examine the effect of day of the estrous cycle at GnRH-1 and growth rate of the dominant follicle (from d -5 or d -2 [$PGF_{2\alpha}$] to GnRH-2 [d 0]) on ovulatory follicle size at GnRH-2. Pubertal beef heifers (n = 63) were allotted by age, weight, and breed to receive GnRH-1 on d 2 (no dominant follicle), 5 (first wave small dominant follicle), 10 (first wave large dominant follicle), 15 (second wave dominant follicle), or 18 (second or third wave large dominant follicle) after estrus (d 0 = estrus; n = 10 to 14 per group). Ovulatory response to GnRH-2 was greatest when GnRH-1 was administered on d 2, 5 or 10 compared to d 15 or 18, since many of the heifers in the d 15 and 18 groups were detected in estrus and ovulated on or before $PGF_{2\alpha}$injection. There was no difference (P>0.1) in follicle growth from d-5 to GnRH-2 among heifers given GnRH-1 injection on d 2, 5, or 10 of the cycle or based on ovulatory response to GnRH-1. Growth rate of the ovulatory follicle was less ($P < 0.01$) for ovulatory follicles that were < 11 mm compared to ovulatory follicles ≥ 11 mm (0.57 mm/d vs. 0.90 mm/d, respectively). Ovulatory follicle size and serum concentrations of estradiol at GnRH-2 were correlated (r=.67; P<.01). In summary, ovulatory follicle size was affected by growth rate from d -5 to GnRH-2 but not d of GnRH-1 injection or ovulatory response to GnRH-1.

Key Words: Estrus Synchronization, Ovulatory Follicle Size, Beef Heifers

W169 Early postpartum treatment of dairy cows with GnRH does not improve fertility. A. Ata and M. S. Gulay*, *Mehmet Akif Ersoy University*, *Burdur, Turkey*.

The objective of the current experiment was to determine the effect of early postpartum treatment with GnRH on reproductive performance of dairy cows. Two hundred thirty seven multiparous Holstein cows (3 to 10 yr old) averaging 13.1 d in milk at the start of the study were housed in a semi-open, freestall barn and were randomly assigned to GnRH (TRT; n = 126) and control (C; n = 111) groups. Cows in TRT group were given an iv injection of Receptal (5 mL; 0.0042 mg buserelin acetate) at assignment, whereas cows in C were not given Receptal. After assignment, estrus was confirmed based on secondary signs of estrus. Uterus and ovaries were checked by rectal palpation once a week, Graffian Follicles were confirmed and cyclic cows were inseminated. AI was performed according to the am-pm rule and pregnancies were confirmed by rectal palpation 45 - 60 d after AI. Open cows were re-inseminated until confirmed pregnant. Cows that did not cycle were injected with PGF2α, whereas cows with metritis were treated with antibiotics. Mean number of AI for pregnancy was 2.5 and 2.4 for TRT and C, respectively. Percentages of cows injected with PGF2α were 43.6 (TRT) and 51.3 (C). Days to first estrus were less for cows in TRT (TRT = 42.6 vs. C = 68.0 d; P<0.05). The days open in cows that became pregnant did not differ between groups (TRT = 127.7 vs. C = 127.2 d). First (20.5 vs. 20.4%), second (41.1 vs. 39.7%), third (16.6 vs. 22.8%), fourth (10.7 vs. 10.8%), fifth (5.8 vs. 3.6%) and sixth (2.9 vs. 1.2%)-service conception rates also were similar for TRT and C. Overall, no significant effects of early postpartum injections of GnRH were detected on pregnancy rates (TRT = 80.9 vs. C = 74.7%). Number of cows with metritis was greater in TRT (13.4%) than C (5.4%) (P<0.05). Results indicated that although early postpartum injections of GnRH decreased the days for first estrus, it did not improve fertility.

Key Words: GnRH, Dairy Cows, Conception Rates

W170 Factors associated with ovulatory follicle growth rate and diameter in postpartum beef cows. J. A. Atkins*[1], T. W. Geary[2], and M. F. Smith[1], [1]*University of Missouri*, *Columbia*, [2]*USDA ARS, Ft. Keogh*, *Miles City, MT*.

Beef cows induced to ovulate small (≤11 mm) follicles had reduced establishment and maintenance of pregnancy compared to cows ovulating large (>11 mm) follicles when bred after the CO-Synch protocol (GnRH1 on d -9, $PGF_{2\alpha}$ on d -2, and GnRH2 with timed AI on d 0). The reason for the presence of small ovulatory follicles is unknown but could be explained by failure to ovulate and synchronize a new follicular wave at GnRH1 or slower growth rate leading to GnRH2. Experiments were conducted in cycling (n = 60) or suckled, postpartum anestrous (n = 55) beef cows. Cycling cows were assigned to 1 of 5 treatments (n = 12 per treatment) based on day of the cycle at GnRH1 of the CO-Synch protocol (d 2, 5, 9, 13, and 18 [estrus = d 0]). The anestrous cow experiment was a 2x2 factorial design (n = 9 to 18 per treatment) based on ovulation (GnRH1+) or failure to ovulate (GnRH1-) to GnRH1 and presence (CIDR+) or absence (CIDR-) of a CIDR from GnRH1 to $PGF_{2\alpha}$. Only cows ovulating to GnRH2 were used to analyze follicle growth. For the cycling cow experiment, follicle growth from d -5 to 0 was greatest in d 18 cows, followed by d 13, 5, 9, and 2 cows (1.1^{a}, 0.72^{ab}, 0.67^{ab}, 0.66^{b}, and 0.47^{b} mm/d, respectively; ^{ab}P<0.05). Cows that ovulated following GnRH1 had faster follicle growth from d -5 to d 0 than did the cows that did not ovulate (0.79 vs. 0.49 mm/d; P<0.05). Follicle growth was slower in d 2 cows than d 9 cows from d -2 to 0 (0.339 vs. 1.29 mm/d, respectively; P<0.05) but was similar among all other treatment groups (1.06, 1.13, and 1.28 mm/d in the d 5, 13, and 18 cows, respectively). In the anestrous cow experiment, GnRH1+ cows had greater follicle growth from d -5 to 0 (P<0.01) compared to GnRH1- but similar growth rate from d -2 to 0 (P>0.10), while CIDR+ cows had faster growth rate from d -2 to 0 (P<0.05) compared to CIDR- cows but the growth rate was similar from d -5 to 0. In both experiments, follicle growth was faster (P<0.05) from d -5 to d 0 in cows ovulating large (>11 mm) compared to small follicles. Research supported by USDA 2006-35203-17284

Key Words: Beef Cows, Ovulatory Follicle Size

W171 Effect of reducing the period of follicle dominance in a timed AI protocol on reproduction of dairy cows. R. C. Chebel*[1], F. Rivera[1], C. Narciso[1], W. W. Thatcher[2], and J. E. P. Santos[2], [1]*University of California*, *Davis*, [2]*University of Florida*, *Gainesville*.

Objectives were to determine the effect of reducing the period of follicle dominance in a timed AI protocol on pregnancy risk (PR) in dairy cows. In experiment 1 (Exp 1), 164 Holstein cows received 2 injections of prostaglandin $F_{2\alpha}$ (PGF, cloprostenol sodium) at 37 and 51 d in milk (DIM). At 61 DIM, cows were randomly assigned to: Cosynch 72 h (CoS72: d 61 GnRH, d 68 PGF, d 71 GnRH + timed AI) or 5 d-Cosynch 72 h with one (5dCoS1: d 61 GnRH, d 66 PGF, d 69 GnRH + timed AI) or two injections of PGF (5dCoS2: d 61 GnRH, d 66 and 67 PGF, d 69 GnRH + timed AI). Blood was sampled at the first GnRH, first PGF, and at timed AI and assayed for progesterone (P4). Ultrasound of the ovaries was performed to determine ovulatory responses to treatments. In experiment 2 (Exp 2), 933 cows were randomly assigned to CoS72 or 5dCoS2. Blood was sampled as described for Exp 1 and also 7 d after timed AI and assayed for P4. Ultrasound of the ovaries was performed as described for Exp 1. Pregnancy was diagnosed on d 38 and 66 after

timed AI. In Exp 1, CL regression differed ($P < 0.01$) and were 78.0, 58.7 and 95.8% for CoS72, 5dCoS1, and 5dCoS2, respectively. Cows that ovulated to the first GnRH of the Cosynch had less ($P < 0.01$) CL regression than cows that did not ovulate (68.6 vs. 90.8%). In Exp 2, CL regression (92.0 vs. 96.0%) was less ($P = 0.02$), but detection of estrus at timed AI (30.9 vs. 23.6%) was greater ($P < 0.01$) for CoS72 than 5dCoS2, respectively, and cows in estrus had increased ($P < 0.01$) PR (46.0 vs. 31.9%). Nevertheless, PR was greater ($P = 0.03$) for 5dCoS2 than CoS72 (37.7 vs. 31.1%). For cows with P4 < 1 ng/mL at timed AI, PR also were greater ($P < 0.01$) for 5dCoS2 than CoS72 (40.1 vs. 34.2%). Concentrations of P4 were similar between treatments and averaged 2.9 ng/mL 7 d after AI. Treatment with PGF on d 5 and 6 after GnRH resulted in high luteolysis and allowed for reducing the interval from GnRH to timed AI, which increased PR. Improvements in PR for 5dCoS2 were observed despite changes in luteolysis. This study reinforces the concept that reducing follicle dominance in timed AI protocols improves PR in dairy cows.

Key Words: Dairy Cow, Follicle Dominance, Reproduction

W172 Effects of an additional PGF2α and estradiol-17β during Ovsynch in lactating dairy cows. D. J. Brusveen*, A. H. Souza, and M. C. Wiltbank, *University of Wisconsin*, *Madison*.

This study was designed to evaluate whether decreasing circulating progesterone (P4) and increasing circulating estradiol-17β (E2) near the time of AI in an optimized Ovsynch protocol would increase pregnancies per AI (P/AI) in lactating dairy cows. Six hundred and nineteen lactating Holstein cows (n = 782 inseminations) received Ovsynch (GnRH-7d-$PGF_{2\alpha}$ -56h-GnRH-16h-timed AI). Cows were randomized in a 2 x 2 factorial design to receive or not receive: 25 mg $PGF_{2\alpha}$ 24h after the normal $PGF_{2\alpha}$ of Ovsynch and/or 0.5 mg of E2 at the time of the final GnRH. Blood samples were collected at 24h after the normal $PGF_{2\alpha}$ (BS1) and again at the time of the final GnRH (BS2) to evaluate circulating P4. Ovarian ultrasound was done at the time of the final GnRH to determine preovulatory follicle size and ovulation was confirmed by ultrasound 5 d after AI. Treatment with an additional $PGF_{2\alpha}$ increased the percentage of cows that regressed their CL (95.6%) compared to control cows (84.6%; $P < 0.001$). However, additional $PGF_{2\alpha}$ had no effect ($P > 0.1$) on overall P/AI (44.7; n = 379 vs. 41.5%; n = 393, treatment vs. control, respectively). Supplementation with E2 increased ($P < 0.001$) expression of estrus (84.4% vs. 37.2%), but had no effect ($P = 0.731$) on fertility (42.2%; n = 393 vs. 43.9%; n = 379). Thus, it appears that an additional $PGF_{2\alpha}$ treatment increases synchronization during Ovsynch; however, supplementation with 0.5 mg E2 at the time of the final GnRH did not improve fertility to Ovsynch.

Key Words: Ovsynch, Estradiol-17β, Prostaglandin-F2α