116 Factors affecting pre-ovulatory follicular diameter and ovulation rate following GnRH administration in anestrous beef cows. J. A. Atkins*[1], T. W. Geary[2], K. J. Wells[3], M. C. Lucy[1], and M. F. Smith[1], [1]*University of Missouri*, *Columbia*, [2]*USDA ARS Fort Keogh*, *Miles City, MT*, [3]*Michigan State University*, *East Lansing*.

Induced ovulation of small dominant follicles (< 12 mm) was associated with reduced pregnancy rates and increased late embryonic/fetal loss in beef cows. Factors affecting ovulatory follicle size following follicular wave synchrony remain unclear. The objective of the present study was to determine factors affecting ovulatory follicle size among suckled, postpartum anestrous beef cows. Follicular waves of anestrous beef cows (n = 55) were synchronized with GnRH1 on d -9, and PG on d -2, with (n = 26) or without (n = 29) an exogenous progesterone insert (CIDR) from GnRH1 to PG. Ovulation was induced 48 h after PG with GnRH2 and ovulatory follicle diameter was recorded. Ovulatory response to GnRH1 (Ov1+/Ov1-) and CIDR treatment (CIDR+/CIDR-) resulted in a 2 x 2 factorial design with 9, 17, 11, and 18 cows in the Ov1+/CIDR+, Ov1-/CIDR+, Ov1+/CIDR-, and Ov1-/CIDR- groups, respectively. There was no difference (P > 0.05) in the proportion of Ov1+ (16/20; 80%) and Ov1- (23/35; 66%) cows ovulating at GnRH2, nor was there a difference (P > 0.05) in the proportion of CIDR+ (19/26; 73%) and CIDR- (20/29; 69%) cows that ovulated at GnRH2. There was no interaction (P > 0.05) of ovulation and CIDR treatment on the proportion of cows ovulating to GnRH2 (7/9, 12/17, 9/11, and 11/18 of the Ov1+/CIDR+, Ov1-/CIDR+, Ov1+/CIDR-, and Ov1-/CIDR- treated cows, respectively). Ovulatory follicle diameter at GnRH2 was larger (P < 0.05) in Ov1+ cows (12.3 mm) than Ov1- cows (11.0 mm), but not different (P > 0.05) between CIDR+ (11.8 mm) and CIDR- (11.2 mm) cows. In summary, neither ovulation to GnRH1 nor CIDR administration affected the proportion of cows ovulating to GnRH2. Additionally ovulation to GnRH1, but not CIDR treatment resulted in ovulation of a larger follicle at GnRH2 among suckled, postpartum anestrous beef cows.

Key Words: Beef Cows, Ovulatory Follicle Size, Fertility

117 Comparison of protocols to synchronize estrus and ovulation I: Estrous cycling beef heifers. N. R. Leitman*, D. C. Busch, J. F. Bader, D. J. Wilson, M. R. Ellersieck, M. F. Smith, and D. J. Patterson, *University of Missouri*, *Columbia*.

The experiment compared estrous response, and synchrony of estrus and ovulation in estrous cycling beef heifers treated with one of four estrus synchronization protocols. Estrous cycling heifers were randomly assigned to one of four treatments (n=12 per treatment) by age and weight. Blood samples were collected 10 and 1 d prior to treatment initiation to confirm estrous cyclicity status (progesterone ≥ 0.5 ng/mL). Heifers assigned to CIDR Select (T1) received a CIDR insert (1.38 g progesterone) from d 0 to 14 followed by GnRH (100 µg Cystorelin) on d 23 and PG (25 mg Lutalyse) on d 30. Heifers assigned to Select-Synch + CIDR (T2) received a CIDR insert and GnRH on d 23 and PG at CIDR removal on d 30. Heifers assigned to CIDR-PG (T3) received a CIDR insert on d 23 and PG at CIDR removal on d 30. Heifers assigned to Select-Synch (T4) received GnRH on d 23 and PG on d 30. Heifers were fitted with HeatWatch® transmitters at the time of CIDR removal (T1, T2, and T3) or at GnRH (T4) for continuous estrus detection. Ovaries were scanned by ultrasonography on d 22, 23, and 25 to determine response to GnRH, and daily from d 30 to estrus. Beginning 20 h after the onset of standing estrus, ovaries were scanned every 4 h until ovulation. There was no difference (P > 0.05) in ovulatory response to GnRH (75, 42, and 75%; T1, T2, and T4, respectively) or estrous response (92, 100, 100, and 75%; T1, T2, T3, and T4, respectively). Variance for interval to estrus after PG differed (P < 0.002) between T1 and T2, and (P < 0.05) T1 and T4. Mean ‡SE intervals to estrus were 52 ‡ 3.7, 49 ‡ 3.5, 51 ‡ 3.5, and 48 ‡ 4.1 h for T1, T2, T3, and T4, respectively. Variance for interval to ovulation after PG differed (P < 0.05) among T1 and each of the other treatments. Mean intervals to ovulation were 83 ‡ 3.9, 80 ‡ 3.9, 81 ‡ 3.7, and 77 ‡ 4.3 h for T1, T2, T3, and T4, respectively. These smaller variances, for interval to estrus and ovulation, among CIDR Select treated heifers resulted in a significant improvement in synchrony of estrus and ovulation compared with the other three treatments.

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Key Words: Progestin, Estrus Synchronization, Beef Heifer

118 Comparison of protocols to synchronize estrus and ovulation II: Prepubertal beef heifers. N. R. Leitman*, D. C. Busch, J. F. Bader, D. J. Wilson, M. R. Ellersieck, M. F. Smith, and D. J. Patterson, *University of Missouri*, *Columbia*.

The experiment compared estrous response, and synchrony of estrus and ovulation in prepubertal beef heifers treated with one of two CIDR-based estrus synchronization protocols. Prepubertal beef heifers were assigned to one of two treatments by age and weight. Blood samples were collected 10 and 1 d prior to treatment initiation to confirm estrous cyclicity status (progesterone < 0.5 ng/mL). Heifers assigned to CIDR Select (n=14; T1) received a CIDR insert (1.38 g progesterone) from d 0 to 14 followed by GnRH (100 µg Cystorelin) on d 23 and PG (25 mg Lutalyse) on d 30. Heifers assigned to Select-Synch + CIDR (n=11; T2) received a CIDR insert and GnRH on d 23 and PG at CIDR removal on d 30. Heifers were fitted with HeatWatch® transmitters at the time of CIDR removal for continuous estrus detection. Ovaries were scanned by ultrasonography on d 22, 23, and 25 to determine ovulatory response to GnRH, and daily from d 30 to estrus. Beginning 20 h after the onset of estrus, ovaries were scanned every 4 h until ovulation. More (P = 0.02) T1 heifers responded to GnRH than T2 heifers (86% T1; 36% T2). There was no difference (P > 0.05) in estrous response, or in the interval from PG to estrus or ovulation. In summary, there was no difference between treatments in the variances for interval to estrus or ovulation among prepubertal heifers. Results from a concurrent experiment (See Leitman et al., 2007; Experiment I) were analyzed with these data to compare these two treatments among mixed groups of estrous cycling and prepubertal beef heifers. Response to GnRH (P < 0.01; 81% T1 and 39% T2), and the variances for interval to estrus and ovulation were smaller (P < 0.01) for T1 than T2. After results for the two treatments (prepubertal and estrous cycling) were combined, the CIDR Select protocol improved (P < 0.01) synchrony of estrus and ovulation compared with the Select Synch + CIDR protocol. These data suggest that the CIDR Select protocol may facilitate fixed-time AI more effectively in mixed groups of estrous cycling and prepubertal heifers.

This research was supported by USDA-NRI grant 2005-55203-15750.

Key Words: Progestin, Estrus Synchronization, Beef Heifer

119 Pregnancy rates following fixed-time AI in beef heifers after administration of CIDR-based protocols to synchronize estrus and ovulation. D. C. Busch*[1], D. J. Wilson[1], D. J. Schafer[2], N. R. Leitman[1], J. K. Hadek[2], M. R. Ellersieck[1], M. F. Smith[1], and D. J. Patterson[1], [1]*University of Missouri*, *Columbia*, [2]*MFA Inc.*, *Columbia, MO*.

Pregnancy rates after fixed-time AI (FTAI) were compared in beef heifers following administration of two CIDR-based protocols. The objective was to determine if long term progesterone treatment prior to a GnRH-prostaglandin $F_{2\alpha}$ (PG) regimen would improve estrous response and FTAI pregnancy rates compared to a CO-Synch + CIDR protocol. Heifers at three locations (n = 78, 61, 78) were assigned to one of two treatments by reproductive tract score (RTS; 1 to 5, 1 = immature, and 5 = cycling) age, and weight. Heifers assigned to treatment 1 (CIDR Select) received an EAZI-BREED™ CIDR® insert (CIDR; 1.38 g progesterone) from d 0 to 14 followed by GnRH (100 µg, i.m. Cystorelin) 9 d after CIDR removal (d 23) and PG (25 mg, i.m. Lutalyse) 7 d after GnRH treatment (d 30). Heifers assigned to treatment 2 (CO-Synch + CIDR) were injected with GnRH and equipped with a CIDR insert on d 23 and PG was injected and CIDR removed on d 30. Heifers at location 1 were fitted with HeatWatch® transmitters at PG until 24 d after FTAI to allow for continuous estrus detection. FTAI was performed at predetermined fixed-times for heifers in both treatments at 72 or 54 h after PG for the CIDR Select and CO-Synch + CIDR groups, respectively. All heifers were injected with GnRH at AI. Blood samples were collected 10 d before and immediately prior to treatment initiation (d 0) to determine pre-treatment estrous cyclicity (progesterone ≥ 0.5 ng/mL). At Location 1, estrous response during the synchronized period was higher (P = 0.06; 87 vs. 69%, respectively) and the variance for interval to estrus after PG was reduced among CIDR Select (P < 0.01) versus CO-Synch + CIDR treated heifers. FTAI pregnancy rates were higher (P = 0.02) following the CIDR Select protocol (62%) compared to the CO-Synch + CIDR protocol (47%). In summary, the CIDR Select protocol resulted in a higher and more synchronized estrous response and significantly higher FTAI pregnancy rates compared to the CO-Synch + CIDR protocol.

This research was supported by USDA-NRI grant 2005-55203-15750, and Select Sires, Inc.

Key Words: Artificial Insemination, Beef Heifers, Estrus Synchronization

120 Timing of fixed-time AI in beef cows following the CO-Synch + CIDR protocol. D. C. Busch*[1], D. J. Schafer[2], N. R. Leitman[1], D. J. Wilson[1], J. K. Haden[2], M. F. Smith[1], and D. J. Patterson[1], [1]*University of Missouri*, *Columbia*, [2]*MFA Inc.*, *Columbia, MO*.

The objective was to compare pregnancy rates in postpartum beef cows to fixed-time AI (FTAI) after administration of the CO-Synch + CIDR protocol. Cows (n = 435) at two locations (n = 210, 225) were stratified by age, BCS and days postpartum (DPP) to one of two FTAI intervals. Cows assigned to CO-Synch + CIDR were injected with GnRH (100 µg, i.m. Cystorelin) and equipped with an EAZI-BREED™ CIDR® insert (CIDR, 1.38g progesterone, d 0). CIDR inserts were removed 7 d later at the time PG (25 mg i.m. Lutalyse) was administered (d 7). Continuous estrus detection was performed at Location 1 using HeatWatch®. Transmitters were fitted at the time of PG and removed at the time of AI. Artificial insemination was performed at predetermined fixed-times [54 h (TAI 54; n = 216) or 66 h (TAI 66; n = 219) after PG] and all cows were injected with GnRH (100 µg, i.m. Cystorelin) at AI. Blood samples were collected 10 d and 1 d prior to treatment initiation to determine pre-treatment estrous cyclicity [progesterone ≥ 0.5 ng/ml; (TAI 54, 170/216, 79%; TAI 66, 177/219, 81%); P=0.45]. At Location 1, more cows exhibited estrus prior to TAI 66 than TAI 54 (P = 0.02; 46/106, 43% and 28/104, 27%, respectively). Pregnancy rates were higher (P < 0.01) among cows that exhibited estrus than for those that did not (60/74, 81% and 71/135, 53%, respectively). There were no treatment by location interactions (P > 0.10) for age, DPP, or BCS, thus the results were pooled for the respective treatments. Pregnancy rates resulting from fixed-time AI did not differ between treatments [P = 0.20; (TAI 54, 126/215, 59%; TAI 66 141/219, 64%)], among sires (P = 0.13) or technicians (P = 0.15). However, when only considering cows ≥ 3 year of age, significantly more cows conceived to the FTAI when AI was performed at 66 h compared to 54 h (118/167, 71% and 96/163, 59%, respectively). There was no difference between FTAI pregnancy rates based on pre-treatment estrous cyclicity status (P = 0.12), and no difference (P = 0.53) between treatments in final pregnancy rates. In summary, cow age group should be considered when recommending timing for FTAI following the CO-Synch + CIDR protocol.

Key Words: Artificial Insemination, Estrus Synchronization

121 Comparison of the 7-11 estrous synchronization protocol between suckled Angus (AN) and Brangus (BN) cows. R. D. Esterman*, B. R. Austin, S. A. Woodall, and J. V. Yelich, *University of Florida*, *Gainesville*.

Suckled AN (n=44) and BN (n=38) cows were used to evaluate the effectiveness of GnRH to initiate ovulation when given 4 d after a 7 d melengestrol acetate (MGA) treatment and to eventually synchronize estrus. Mean BW, days postpartum, and body condition score (Scale 1-9) for AN and BN were 488 ± 10 and 514 ± 11 kg, 63.1 ± 3.7 and 57.4 ± 4.0 d , and 5.5 ± 0.8 and 5.6 ± 0.8, respectively. Start of experiment was d 0 and blood samples were collected on d -12 and -2 to determine estrous cycling status by measuring blood progesterone (P). On d 0, MGA (0.5 mg/head/d) treatment was started with prostaglandin F2α (PG1; Lutalyse®) on d 7 followed by GnRH (100 µg; Cystorelin®) on d 11. On d 18, PG (PG2) was administered and estrus was detected for 5 d with HeatWatch®, followed by AI 8 to 12 h after the onset of estrus. On d 0, 7, 11, and 18, blood samples were collected to evaluate P. Three groups of cows were used to evaluate ovarian function via ultrasonography on d 7, 11, 13, and 18, including anestrus (low P, < 1 ng/mL, d -12 and -2; ANEST; AN=6, BN=6), estrous cycling with low P on d -12 and high P (> 1 ng/mL) on d -2 (CYCH; AN=6, BN=6), and estrous cycling with high P on d -2 with PG on d 0 to mimic a low P environment during MGA (CYCL; AN=6, BN=6). Ovulation rate and size of follicle ovulating to GnRH were similar (P > 0.05) for AN (17/18=94.4%; 16.9 ± 0.8 mm) and BN (17/18=94.4%; 17.7 ± 0.8 mm), respectively. Size of follicle ovulating to GnRH tended (P = 0.09) to be greater for CYCL (18.6 ± 0.9 mm) and ANEST

(17.7 ± 0.9 mm) compared to CYCH (15.8 ± 0.9 mm). Largest follicle at PG2 (13.3 ± 0.3 mm) was similar (P > 0.05) for scan group, breed, and scan group × breed. Luteolysis tended (P = 0.09) to be greater for AN (39/41=95.1%) compared to BN (31/37=83.8%). Estrous (70.5, 65.8%), conception (67.7, 76.0%), and synchronized pregnancy rates (47.7, 50.0%) were similar (P > 0.05) for AN and BN, respectively. In conclusion, suckled AN and BN cows responded similarly to the 7-11 synchronization protocol.

Key Words: Estrous Synchronization, GnRH, PG

122 The use of estrus synchronization, resynchronization, and ultrasound to facilitate two timed artificial inseminations without heat detection in beef cattle. W. E. Beal*, M. D. Utt, and T. E. Wiseman, *Virginia Polytechnic Institute and State University*, *Blacksburg*.

The objective was to evaluate the use of AI after synchronization and resynchronization of estrus without heat detection. Angus cows (n=37) or heifers (n=22) received GnRH (100 µg, i.m.) and an intravaginal progesterone-releasing device (CIDR). The CIDR remained in place for 7 d. Animals received 25 mg of $PGF_2\alpha$ (PG; i.m.) at CIDR removal. The control group (C; n=28) was observed for estrus and bred 12 h after estrus detection. The timed AI group (TAI; n=31) was inseminated and received GnRH 64 h after CIDR removal. Animals in both groups were fitted with a used CIDR 13 d after TAI. The used CIDR was removed after 7 d. Following removal of the used CIDR, C animals not detected in estrus after the first CIDR received an injection of PG. Animals in the C group were inseminated 12 h after estrus detection. Sixty-four hours after removal of the used CIDR, pregnancy was diagnosed by ultrasonography (Aloka 500V) in the TAI group. Non-pregnant animals in the TAI group were inseminated and received GnRH. At the time of the first or second AI, the maximum diameter and estimated blood flow serving the ovulatory follicle were determined by B-mode and color-flow Doppler ultrasonography (Aloka 3500V). Pregnancy diagnosis was performed 30 d after the last AI. Pregnancy rate following the removal of the first CIDR did not differ (P=.10) between C (14/28; 50%) and TAI (22/31; 71%). Final pregnancy rates were 19/28 (68%) and 27/31 (89%) in the C and TAI groups, respectively (P=.08). Mean diameter of the ovulatory follicle (15.6 ± .34 mm) did not differ between treatment groups. However, blood flow to the ovulatory follicle was greater (P<.02) in C than in TAI animals. This method of AI after synchronization and resynchronization of estrus without heat detection resulted in pregnancy rates similar to those achieved when AI was performed after heat detection.

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Key Words: Estrus Synchronization, Timed AI, Beef Cattle

123 Effect of GnRH at time of insemination on initiation of LH pulses and subsequent progesterone. S. D. Fields*, B. L. Perry, and G. A. Perry, *South Dakota State University*, *Brookings*.

Research has indicated that LH pulses play a vital role in CL formation and subsequent progesterone concentrations. Therefore, our objectives were to determine when LH pulses begin following onset of estrus, what effect an injection of GnRH would have on initiation of LH pulses, and what effect LH pulse initiation had on subsequent progesterone concentrations. Cows were synchronized with the Select Synch+CIDR protocol (d -7 100 µg GnRH and CIDR; d 0 25 mg PG and removal of CIDR; estrus detected with HeatWatch). Following detection in estrus, a jugular catheter was inserted in each cow (n = 10). Based on initiation of estrus, cows were allotted into two treatments: 1) GnRH given 12 h (12.5 ± 1.2 h) after the initiation of estrus (n = 5; 100 µg) and 2) Control (n = 5). Blood samples were collected at 15-min intervals for 6 h at 12 h (bleed 1), 26 h (bleed 2), 40 h (bleed 3), 54 h (bleed 4), and 68 h (bleed 5) after the onset of estrus. Interval from onset of estrus to bleed 1 and ovulation was similar between treatments ($P = 0.80$). GnRH cows tended ($P = 0.08$) to have a greater area under the LH curve for bleed 1 compared to Control. No differences were detected ($P > 0.47$) in bleeds 2, 3, 4, or 5. Average concentration of LH for GnRH cows in bleed 1 tended ($P = 0.07$) to be greater than control. No differences were detected ($P > 0.53$) in bleeds 2, 3, 4, or 5. No differences ($P > 0.31$) were detected in pulse frequency between treatments in bleeds 1, 3, 4, or 5, but in bleed 2, Control tended ($P = 0.095$) to have more pulses than GnRH (2.5 ± 0.5 vs 1.4 ± 0.4, respectively). GnRH treated cows tended ($P = 0.07$) to have greater subsequent progesterone concentrations; however, GnRH-treated cows that had no LH pulses during bleed 2 had lower ($P = 0.02$) progesterone concentrations than cows with pulses (Control or GnRH). In summary, injecting cows with GnRH approximately 12 h after the onset of estrus tended to reduce LH pulses 26–32 h following initiation of estrus, and elimination of LH pulses between 26–32 h resulted in decreased concentrations of progesterone during the subsequent cycle.

Key Words: LH, GnRH, Progesterone

124 Effect of pretreatment with prostaglandin $F_{2\alpha}$ 12 days before initiation of Resynch on fertility of lactating dairy cows. E. Silva*[1], R. A. Sterry[1], D. Kolb[2], M. C. Wiltbank[1], and P.M. Fricke[1], [1]*University of Wisconsin*, *Madison*, [2]*Lodi Veterinary Clinic*, *Lodi, WI.*

Our hypothesis was that pretreatment with $PGF_{2\alpha}$ (PGF) 12 d before initiation of Resynch would increase the number of cows with a CL at the first GnRH injection of Resynch thereby increasing fertility to Resynch. Lactating Holstein cows diagnosed not pregnant 31 d after their first postpartum timed AI (TAI; d 0) were randomly assigned by parity to receive each of two resynchronization treatments as follows: 1) RES (n=255), GnRH (d 32), PGF (d 39), GnRH 54 h after PGF, or 2) PGF+RES (n=272), PGF (d 34), GnRH (d 46), PGF (d 53), GnRH 54 h after PGF. All cows received TAI 16 h after the last GnRH injection, and cows failing to conceive to first Resynch TAI remained in the same treatment for a second Resynch TAI. Blood samples were collected from all cows at the first GnRH injection of Resynch to determine luteal status based on serum progesterone (P4). Fertility to first postpartum TAI 31 d after Presynch+Ovsynch was 37.0 % (n=836). Overall, PGF+RES cows had more P/AI 31 d (38.5 vs. 31.1 %; P=0.06) and 66 d (35.2 vs. 25.6 %; P=0.01) after TAI and fewer pregnancy losses from 31 to 66 d (7.6 vs. 17.1 %, P=0.04) after TAI than RES cows. Although cows with low P4 at initiation of Resynch had fewer P/AI 31 d (25.0 vs. 37.8 %, P=0.008) and 66 d (20.3 vs. 33.2 %, P=0.005) after TAI than cows with high P4, pretreatment with PGF did not affect the number of cows with high P4 at initiation of Resynch (76.1 vs. 73.1 for RES vs. PGF+RES cows, respectively) which was inconsistent with our hypothesis. In conclusion, although pretreatment with PGF resulted in more P/AI at 66 d after TAI than traditional Resynch due to both more P/AI at 31 d after TAI and reduced pregnancy

losses, this effect could not be attributed to increasing the number of cows with a CL at initiation of Resynch. Furthermore, PGF+RES cows had a 2 wk delay in the Resynch TAI compared to RES cows which would diminish the impact of improved fertility on 21-day pregnancy rate.

Key Words: Resynch, Prostaglandin F $_{2\alpha}$, Dairy Cows

125 Reducing the interval from Presynchronization to initiation of timed AI improves fertility in dairy cows. K. N. Galvao*, M. F. Sa Filho, and J. E.P. Santos, *School of Veterinary Medicine, University of California Davis*, *Tulare*.

Objectives were to determine if shortening the interval from presynchronization to the first GnRH (G1) in a Presynch/timed AI (TAI) protocol improves conception rate (CR). Holstein cows, 1214, at 37±3 d in milk (DIM) were stratified by parity, DIM, and milk yield, and randomly assigned to: PShort (n = 410), two injections of PGF2a (PG) at 40 and 54 DIM, then enrolled in a TAI 11 d later; PShortG (n = 392), same as PShort, but with an injection of GnRH 7 d before G1; Control (n = 412), two injections of PG at 37 and 51 DIM, then enrolled in a TAI 14 d later. All cows received the same TAI protocol (d 65, G1; d 72, PG; d 73, 1 mg of ECP; d 75, TAI). A subset of 1000 cows had their ovaries scanned at 65 and 72 DIM, which coincided with injections of GnRH and PG of TAI, respectively, to determine CL and ovulation to G1. Pregnancy was diagnosed on d 38 and 65 after AI. Data were analyzed with pre-planned orthogonal contrasts to determine the effect of interval (PShort + PShortG vs. Control) and GnRH treatment (PShort vs. PShortG). Results are depicted in the following sequence: PShort, PShortG, and Control. Presence of a CL at G1 was not influenced (P=0.95) by interval, but GnRH increased (P<0.01) the proportion of cows with CL (74.2, 88.2, and 80.6%). Ovulation to G1 was greater (P<0.01) for the short interval compared with Control, but GnRH did not improve (P=0.28) ovulation (61.4, 62.2, and 44.7%). The increased ovulation to G1 was primarily caused by greater (P<0.01) ovulatory response in cows with a CL at G1 (54.4, 59.7, and 37.2%), but did not differ (P=0.64) for cows without a CL at G1. Treatment affected the CR on d 38, and was greater (P=0.04) for the short interval compared with Control, but addition of GnRH did not improve (P=0.19) CR (40.5, 39.8, and 33.5%). The same effects were observed for CR on d 65 after AI (36.7, 36.2, and 30.5%). Cows ovulating to G1 had greater (P<0.05) CR regardless if they had (42.2 vs. 37.7%) or not (27.6 vs. 15.4%) a CL at G1. Shortening the interval from presynchronization to initiation of TAI from 14 to 11 d increased ovulatory response and conception rates in dairy cows.

Key Words: Dairy Cow, Presynchronization, Reproduction

Production, Management & the Environment - Livestock and Poultry: Dairy Production and Management I

126 Effects of dim light at night on milk yield, milk composition and endocrine profile of lactating dairy cows. M. A. Bal*[1], G. B. Penner[1], M. Oba[1], and A. D. Kennedy[2], [1]*University of Alberta*, *Edmonton, AB, Canada*, [2]*University of Manitoba*, *Winnipeg, MB, Canada*.

Twenty-four multiparous lactating dairy cows (139 ± 34 DIM) were assigned to two different light intensities from 6 PM to 4 AM daily in a cross-over design with 28-d periods to evaluate the effect of night dim-light. It was hypothesized that night dim-light would increase milk production by decreasing melatonin concentration and increasing IGF-1 concentration in plasma. Light intensity during the day was approximately 200 lux and light treatments at night were 0-5 lux (CONTROL) and 40-60 lux (DIM LIGHT). Each group of animal (n=12) was placed on either the north or south side of the tie stall barn. Light intensity of the barn ranged from 40 to 60 lux at night but was reduced to < 5 lux for the CONTROL by placing black tarps near the light fixtures. Feed was offered in a TMR once daily at 9 AM. Blood samples for hormone analyses were taken every two hours at the last day of each period from 6 PM to 2 AM. There was no significant difference for milk, fat, protein, and lactose yields between CONTROL and DIM-LIGHT treatments, averaging 33.2, 1.04, 1.02, and 1.45 kg/d, respectively. Similarly, milk fat and protein concentrations were not affected by treatment. Concentration of lactose was significantly higher ($P < 0.01$) for DIM LIGHT than CONTROL (4.42% vs. 4.38%). Plasma prolactin concentration at 6 PM (during day-time) tended to be higher ($P = 0.07$) for DIM-LIGHT (15.1 ng/ml) than CONTROL (11.4 ng/ml). No change in prolactin was seen from 6 PM to 10 PM with DIM-LIGHT, but it increased 61% from 6 PM (11.4 ng/ml) to 10 PM (18.7 ng/ml) with CONTROL. Plasma IGF-1 concentration was not affected by treatment at 6 PM (123.1 ng/ml) or 10 PM (127.1 ng/ml). Day-time (6 PM) plasma melatonin concentration was relatively high (10.3 pg/ml). Treatment had no effect on the night-time plateau in melatonin found at 10 PM (21.5 pg/ml) and 12 AM (19.8 pg/ml). These data indicate that night dim-light (40-60 lux) modified the natural diurnal rhythm in plasma prolactin but not melatonin, and had a positive effect on milk lactose concentration but not yield.

Key Words: Dim Light, Milk Production, Melatonin and Prolactin

127 Effects of dairy dry lot corral management on air emissions. L. M. Nuckles* and F. M. Mitloehner, *University of California*, *Davis*.

The objective of this study was to evaluate the effects of drylot corral waste management on emissions of smog-forming compounds and greenhouse gases. The San Joaquin Valley of California is the leading dairy region of the United States but also known as the worst non-attainment area for smog. A total of 96 Holstein dry cows were housed in four, totally enclosed cattle pen enclosures (CPEs) and were fed a TMR *ad libitum*. Eight cows were housed in each of the four CPEs during each of three, 14 day replications. The experimental design was a CRD. Cows were randomly sorted into four groups and stratified by weight. Treatments were (1) control, manure accumulated for 14 days (CON), (2) acidifier surface application (sodium bisulfate, SBS), (3) frequent harrowing (HAR), and (4) scraping (SCR). Emissions of the smog-forming alcohols ethanol (EtOH) and methanol (MeOH) as well as the greenhouse gases (GHG) carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) were measured continuously from the CPEs′ air inlets and outlets. Gaseous concentrations were sampled using a photoacoustic gas-analyzer (INNOVA 1412) and emission rates (kg/cow/yr) calculated. Data were analyzed using Proc MIXED procedures in SAS. Overall, alcohol emissions for SBS were lower ($P < 0.05$) compared to all other treatments. EtOH emission rates