Efecto de la suplementación con vitaminas y minerales al inicio de un protocolo de inseminación artificial en la fertilidad de vacas con cría

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Objetivo: Estudiar el efecto de la suplementación con vitaminas y minerales al inicio de un protocolo de inseminación artificial a tiempo fijo (IATF) en la fertilidad de vacas con cría.

Materiales y métodos: Se sincronizó el estro de vacas con cría (n=350) con ≥ 2 partos en Córdoba, Argentina. Al inicio del protocolo de IATF se evaluó la condición corporal de las vacas (CC, escala de 1-5; 1=emaciada – 5=obesa), y se realizó una ultrasonografía transrectal para determinar la ciclicidad ovárica (CYCL; cíclica= presencia de cuerpo lúteo; anovulatoria superficial= folículos ≥ 10 mm; anovulatoria profunda= folículos < 10 mm). A su vez, todos los animales recibieron una vacuna para enfermedades reproductivas (Bioabortogen H® [HVBo tipo 1, VDVB tipo 1 y 2, *Campylobacter fetus fetus, Campylobacter fetus venerealis, Histophilus somni* y *Leptospira interrogans Pomona*], Biogénesis Bagó, Argentina). Las vacas con número de caravana par se asignaron al grupo tratado (TRT, n=190) y se les administró un suplemento de vitamina A y vitamina E (Vitamina A 175 mg, vitamina E 250 mg; Adaptador ® VIT, Biogénesis Bagó) y un suplemento de cobre, zinc, manganeso y selenio (cobre 50 mg, zinc 200 mg, manganeso 50 mg, selenio 25 mg; Adaptador® MIN, Biogénesis Bagó). Las vacas con número de caravana impar se asignaron al grupo control (CON, n=162) y no recibieron suplementación con vitaminas y minerales. Todas las vacas iniciaron el protocolo de sincronización del estro e IATF y el día (d) 0 se les colocó un dispositivo intravaginal de liberación de progesterona (DIV; 0,5 g P4, Cronipres ®, Biogénesis Bagó) y benzoato de estradiol (2mg; Bioestrogen®, Biogénesis Bagó). Al d7, se retiró el DIV y todas las vacas recibieron cipionato de estradiol (CE, 1mg; Croni-Cip®, Biogénesis Bagó), D-cloprostenol (PGF, 150 mg, Enzaprost DC®, Biogénesis Bagó) y gonadotrofina coriónica equina (eCG, 400 UI; Ecegón®, Biogénesis Bagó). Además, al d7, las vacas fueron pintadas en la base de la cola (Celo Test® Biotay, Phibro Animal Health). Las vacas que perdieron más del 50% de la pintura fueron inseminadas a las 48-52 h del retiro del DIV y en aquellas que no se observó celo se aplicó acetato de buserelina (GnRH, 8 µg; Gonaxal®; Biogénesis Bagó) para inducir la ovulación. La IATF la realizaron tres técnicos (TECH) con semen de dos toros (BULL). A los 10 días posteriores a la IATF se ingresaron los toros al rodeo de las vacas para que realicen el servicio natural. El porcentaje de preñez de la IATF se determinó a los 65 d post IATF por ultrasonografía transrectal (Esaote Tringa L, Genoa, Italia). La preñez de IATF (PREÑEZIA) se diferenció de la preñez de servicio natural (PREÑEZSN) por el tamaño del embrión/feto (TPREÑEZ= PREÑEZIA + PREÑEZSN). Los datos se analizaron a través de un modelo de regresión logística que incluyó el efecto de TRT, CYCL, TECH, BULL, GnRH y CC (≥2,75 vs <2,75).

Resultados: La CC fue similar entre los grupos (3,21±0,27; P>0,38). Al inicio del protocolo el 78,41% de las vacas estaban ciclando (P>0,41). La PREÑEZIA tendió a ser mayor en el grupo TRT que en el grupo CON (54,5% [103/189] vs 44,72% [72/161], P=0,06) y la TPREÑEZ fue mayor en el grupo TRT que en el grupo CON (75,13% [142/189] vs 62,73% [101/161], P=0,01). La PREÑEZIA y la TPREÑEZ fue similar para TECH, BULL, CYCL y para las vacas que recibieron o no GnRH para inducir la ovulación a la IATF (P=0,52, P=0,27, P=0,98, P=0,48).

Conclusión: El tratamiento con vitaminas y minerales en vacas al inicio de un protocolo de IATF mejoró el porcentaje de preñez un 12,4%.

both the AI and mounts carried out during the reproductive season) was 82.37% and 83.68% for CIDR-5 and CIDR-7 treatments, respectively; no differences were observed between treatments. The logistic regression analyses indicated that non variables (farm, treatments, parity and cow breed) should be included in the model which explain the pregnancy rate after AI. Parity was included in the model for explaining the pregnancy rate at the return to estrus after AI. Higher total fertility was observed in cows, in contrast to heifers (84.61% vs 79.3%, p<0.05); although no differences were detected for treatments, animals treated with progestogen during 7 days reached soon the higher pregnancy rates, which it is an advantage in contrast with 5-day CIDR treatment. Those animals failing to get pregnant after fixed-time AI were analyzed in order to explore the impact of parity on the pregnancy rate; it was observed that those open cows showed significantly higher pregnancy rates than open heifers (67.21% vs 58.00%, p<0.05). Progesterone-based treatments allow the ovulation induction and time-fixed insemination, reducing the clinical monitoring in treated animals.

Conclusion: In conclusion, the reduction of CIDR treatment from 5 to 7 days offers similar pregnancy rates after AI and for the overall breeding season. When animals do not get pregnant after de AI, it was observed that those open suckler cows showed a significantly higher pregnancy rate at natural mountings that open heifers. In reference to parity, it does not influence on the fertility after AI, but this percentage was higher for sucker in comparison with heifers when the complete breeding season was analyzed.

Keywords: Beef cattle. fixed-time IA, progestogen, synchronization.

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Effect of supplementation with vitamins and minerals at the beginning of a fixed timed AI protocol on fertility of sucking beef cows

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Objective: Study the effect of supplementation with vitamins and minerals at the beginning of a fixed timed AI (FTAI) protocol on the fertility of suckling beef cows.

Material and methods: Estrus was synchronized in sucking beef cows (n=350) with ≥2 parturitions in Cordoba, Argentina. At the beginning of the FTAI protocol, cows were body condition scored (BCS, 1-5 scale; 1=emaciated-5=obese), and transrectal ultrasonography was performed to determine ovarian cyclicity (CYCL; cycling=presence of CL, superficial anovulation=follicles ≥10 m; deep anovulation=follicles<10 mm). In addition, all animals had administered a vaccine for reproductive disease (Bioabortogen H® [BoHV type 1, BVDV type 1 and 2, *Campylobacter fetus fetus, Campylobacter fetus venerealis, Histtophilus somni,* and *Leptospira interrogans Pomona pomona*], Biogénesis Bagó, Argentina). Cows with even tag number were assigned to the treatment group (TRT, n=190) and were administered a vitamin A and E supplement (vitamin A palmitate 175 mg, vitamin E acetate, 250 mg; Adaptador® VIT, Biogénesis Bagó), and a copper, zinc, manganese, and sodium mineral supplement (copper edetate 50 mg, zinc edetate 200 mg, manganese edetate 50 mg, Sodium selenite 25 mg; Adaptador® MIN, Biogénesis Bagó). Cows with odd tag numbers were assigned to the control group (CON, n=162) and were not administered a vitamin and mineral supplement. All cows were started in an estrus synchronization and FTAI protocol and received on day (d) 0 an intravaginal progesterone releasing devise (DIV) insert (0.5 g P_4, Cronipres®, Biogénesis Bagó), and estradiol benzoate (2mg; Bioestrogen®, Biogénesis Bagó). On d7, the DIV insert was removed and al cows were administered estradiol cypionate (CE, 1mg; Croni-Cip®, Biogénesis Bagó), D-cloprostenol (PGF, 150 mg, Enzaprost DC®, Biogénesis Bagó), and equine chorionic gonadotropin (eCG, 400 UI; Ecegon®, Biogénesis Bagó). In addition, at d7, all cows were tail painted (Celo Test® Biotay, Philbro Animal Health). All cows with >50% of tail paint removed were FTAI at 48-52 h of DIV insert removed, and those not detected in heat were administered buserelin acetate (GnRH, 8 ug; Gonaxal®; Biogénesis Bagó) to induce ovulation. All FTAI were done by three technicians (TECH) with the semen of two bulls (BULL). Cows were exposed to bulls for natural service at 10 days post-FTAI. The pregnancy rate to FTAI was determined 65 d after FTAI by transrectal ultrasonography (Esaote Tringa L, Genoa, Italy). Pregnancies resulting from FTAI (PREGAI) were distinguished from natural services pregnancies based on embryo/fetal size (PREGNS; TPREG= PREGAI + PREGNS). Data were analyzed with logistic regression models that included the effects of TRT, CYCL, TECH, BULL, GnRH, and BCS (≥2.75 vs. <2.75).

Results: The BCS was similar between groups (3,21±0,27; P>0,38). At the start of the protocol, 78.41% of cows were cycling (P>0.41). The PREGAI tended to be higher in the TRT than in the CON group (54.50 % [103/189] vs. 44.72% [72/161], P=0.06), and TPREG was higher in the TRT than in the CON group (75.13 % [142/189] vs. 62.73% [101/161], P=0.01). The PREGAI and TPREG were similar for TECH, BULL, CYCL, and cows that received or did not receive a GnRH to induce ovulation at TFAI (P=0.52, P=0.27, P=0.98, P=0.48).

Conclusion: Treatment of beef cows with a vitamin and mineral supplement at the beginning of an FTAI protocol improved the pregnancy rate by 12.4%.

Keywords: Beef, vitamin supplement, mineral supplement, fertility.