the removal of the supernatant and sperm resuspension with YG or SM-P. Additionally, processing semen by SpermFilter enhanced PMI compared to centrifuged semen. Fertility rates of poor cooled semen improved by semen processing by SF and resuspended in SM-P or EY.

Keywords: Stallion, extender, sperm kinetics, bad cooler

Pregnancy rates and subsequent pregnancy losses of in vitro produced embryos from oocytes

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Over the past 5 years there has been an increased utilization of transvaginal aspiration of oocytes and intracytoplasmic sperm injection (ICSI) to produce equine embryos. With this increase in demand has come the increase in the number of commercial ICSI labs and in the number of ICSI-produced embryos being shipped to commercial recipient herds for transfer. There are limited data in the literature describing the pregnancy rates and any subsequent pregnancy losses associated with these shipped ICSI-produced embryos. Data were collected from 2 facilities that performed a total of 572 aspirations over 3 breeding seasons and shipped the oocytes to 5 commercial ICSI labs. Embryos produced were shipped to 2 commercial recipient herds. Pregnancy rates and subsequent losses were calculated for 3 of the ICSI labs; 2 of the labs were not included due to a very small number of embryos transferred from these facilities. In total, 208 fresh embryos were shipped for transfer. Fourteen-day pregnancy rates ranged from 41 to 75%; pregnancy loss rates varied from 12.8 to 60% depending on the TVA Facility/ICSI Lab combination and year. Due to the variability in transfer results both between and within the same facilities, more in-depth research needs to be performed to identify the ideal shipping conditions (media, time in transport, etc.) to maximize pregnancy rates and minimize subsequent pregnancy losses.

TVA Facility/ICSI Lab/Year	Embryos transferred	14-day pregnancies	Pregnancies lost
TVA Facility 1/ICSI Lab A 2018	21	10 (47%)	6 (60%)
TVA Facility 1/ICSI Lab A 2019	12	9 (75%)	2 (22%) - 1 due to twins
TVA Facility 1/ICSI Lab A 2020	53	29 (55%)	8 (27.5%) - 3 due to twins
TVA Facility 1/ICSI Lab B 2019	31	15 (48%)	8 (53%)
TVA Facility 1/ICSI Lab B 2020	24	10 (41%)	5 (50%)
TVA Facility 2/ICSI Lab A 2020	21	14 (66%)	8 (57%) plus 2 late term
TVA Facility 2/ICSI Lab B 2019	13	8 (61%)	2 (25%)
TVA Facility 2/ICSI Lab B 2020	14	8 (57%)	1 (12.8%)
TVA Facility 2/ICSI Lab C 2020	19	13 (68%)	2 (15%)

Keywords: Mare, embryo, ICSI, trans-vaginal aspiration, pregnancy

Incidence rate of reproductive problems in nonpregnant mares

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Broodmares may be affected by a variety of reproductive issues. The goal of this retrospective study was to document reproductive abnormalities encountered in broodmare veterinary practice. Reproductive records of mares managed at Colorado State University were evaluated retrospectively. Reproductive issues were broadly categorized into abnormalities of the ovary, oviduct, uterus, cervix, vagina, perineum, mammary gland, and behavioral concerns. The abnormalities were then assigned to specific subcategories within each broad category. Reproductive records were evaluated for 636 individual mares over a 3-year period (2018 - 2020). A mare was considered positive for an abnormality if the issue was noted at least once during a breeding season. The incidence rate (IR) was calculated as the percentage of mares with a specific abnormality compared to the overall population of mares. Data are presented as the mean ± standard deviation. A total of 862 mare-years were evaluated, as some mares were evaluated over multiple breeding seasons. The average age of the mare population was 11.9 ± 4.8 years and ranged from 3 to 26 years. The most common breeds were American Quarter Horse (383 mares, 60.2% of total), Warmbloods (all breeds combined) (55 mares, 8.6%) and Arabians (26 mares, 4.1%). Most common ovarian issues noted were after 250 µg of cloprostenol treatment were, persistence of luteal tissue (62 cases; 7.2% IR) and hemorrhagic anovulatory follicles

(43 cases; 5.0% IR). Most common oviductal abnormalities were presumptive blocked oviducts (28 cases; 3.2% IR) and parovarian cysts (10 cases; 1.2% IR). Uterine issues comprised the greatest number of abnormalities, including persistent breeding-induced endometritis (PBIE; 189 cases; 21.9% IR), endometrial cysts (137 cases; 15.9% IR), presence of excessive fluid prior to breeding (78 cases; 9.0% IR) and bacterial endometritis (70 cases; 8.1% IR). Most common abnormalities of the caudal reproductive tract were failure of cervical relaxation (36 cases; 4.2% IR), urovagina (6 cases; 0.7% IR), and poor perineal conformation or tone (13 cases; 1.5% IR). Mammary abnormalities were uncommon, with 3 cases of galactorrhea and 2 cases of mastitis. Most common behavioral issues were stallion-like or aggressive behavior (3 cases), recurrent colic or pain (3 cases) that an owner was associating with the reproductive tract and persistent estrus (2 cases). Issues with a higher incidence in mares > 15 years of age included hemorrhagic anovulatory follicles, uterine cysts, persistent breeding-induced endometritis and bacterial endometritis. Mares with a tight cervix or excessive uterine fluid on initial examination had an increased incidence of PBIE (75 and 39.7%, respectively). In conclusion, persistent breeding-induced endometritis was the most common reproductive abnormality and the incidence of reproductive issues increased with advanced age.

Keywords: Equine, mare, reproductive, problems, pathology

Induction of parturition in a late pregnant mare with large colon displacement

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An 11-year-old multiparous pregnant (324 days) Thoroughbred broodmare was presented to Rhinebeck Equine LLP for treatment of right dorsal displacement of the large colon and associated abdominal discomfort. Mare had minimal mammary development. No surgical option was available for the mare; foal survival was the owner's priority. Transrectal and transabdominal ultrasonography examinations revealed a viable fetus in anterior longitudinal presentation with a fetal heart rate of 72 bpm (reference range: 80 - 120 bpm). Mare was treated conservatively with isotonic intravenous fluids (lactated Ringer's 1-2 liters/hour) and intravenous flunixin meglumine (1.1 mg/kg twice daily). Dexamethasone (100 mg once daily) was given intramuscularly at days 325, 326, and 327 to stimulate fetal maturation. Induction of parturition was proposed to allow for delivery of a live foal and possible improvement of colonic displacement postpartum. At 328 days of pregnancy the mare's discomfort persisted and colon displacement was unresolved. Induction of parturition using a low-dose oxytocin protocol was elected. Mare was treated intramuscularly with 5 IU oxytocin; after 25 minutes, a vaginal examination confirmed cervical relaxation. Mare was then treated intravenously with 5 IU oxytocin and had behavioral signs consistent with stage I labor. Following an additional 25 minutes interval, the mare was treated intravenously with 5 IU oxytocin. Seventy minutes after the first oxytocin treatment, stage II labor was initiated with spontaneous rupture of the chorioallantois. Duration of stage II labor was 15 minutes, and the mare delivered a live colt with minimal assistance. Complete and grossly normal fetal membranes were passed within 30 minutes. Foal was given 36 ounces of frozen thawed colostrum via nasogastric intubation, and no gross signs of dysmaturity were noted. The colt received intravenous hyperimmunized plasma and was supplemented with stored mare's milk via esophageal feeding tube for 5 days and remained clinically normal. Mare was started on oral domperidone (1.1 mg/kg, once every 12 hours) to promote mammary development. Colic signs ultimately resolved, and both mare and foal were discharged and remained healthy on farm. Elective induction of parturition in the mare is uncommonly performed due to the marked variation in equine pregnancy length and the relatively late ability of the equine fetal adrenal gland to respond to ACTH. The criteria typically used to assess fetal readiness are length of pregnancy, cervical relaxation, and the presence of colostrum within the mammae. This case highlighted the successful use of oxytocin to induce parturition in a mare despite meeting only 1 of the 3 criteria for fetal readiness. Additionally, dexamethasone was utilized to stimulate precocious fetal maturation prior to induction of parturition.

Keywords: Mare, induction, parturition, oxytocin