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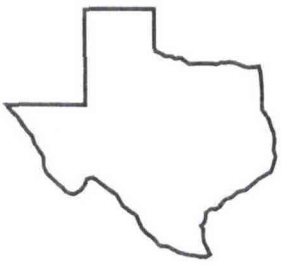
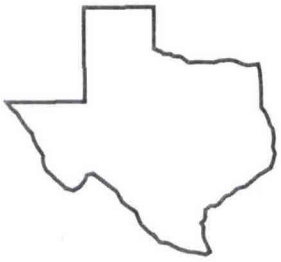
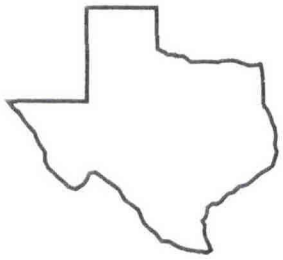
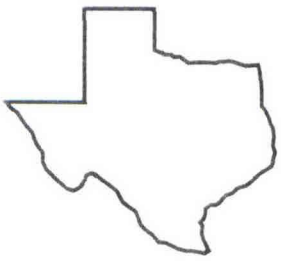




Overton Field Day Report - 1994





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METHODS FOR PREGNANCY DETECTION IN FARMED DEER

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Background. Deer farming, for venison and seed stock production, has progressively grown into an industry in Texas as well as elsewhere in the United States and around the world. To maximize the breeding season in this seasonal species, methods for early pregnancy detection in deer may provide deer producers with information concerning the reproductive status of their herds from which herd strategies may be formulated. Several methods have been utilized for pregnancy diagnosis in deer including ultrasonography, serum progesterone, estrone sulfate and pregnancy-specific protein B (PSPB). The objective of these studies was to investigate the effectiveness of these pregnancy detection techniques in various species of farmed deer including Rocky Mountain elk (*Cervus elephus nelsoni*), sika (*Cervus nippon*) and fallow deer (*Dama dama*).

Research Findings.

Experiment 1. Twenty-five Rocky Mountain elk cows, one bull elk and 3 yearling bulls were maintained on improved pastures on an East Texas ranching operation (Blazing Saddles Ranch, Winona, TX). Two sampling periods were selected during the breeding season with an interval between period 1 and period 2 of 120 days. Blood samples were collected at periods 1 and 2, and transrectal ultrasonography was conducted only at period 2. Our results indicated that elk cows that calved had higher progesterone concentrations (ng/ml) at periods 1 ($5.5\pm.4$) and 2 ($10.3\pm.9$) than cows that remained open ($3.2\pm.7$ and $2.3\pm.3$, respectively). In addition, elk cows that were pregnant at period 2 had higher serum estrone sulfate concentrations (pg/ml) at period 2 (632.3 ± 46.5) than at period 1 ($115.4\pm.5$), and were higher at period 2 than cows that remained open (107.0 ± 2.7). Ultrasonography was 92% accurate in detecting pregnant and open animals at period 2, two cows, 8%, were misdiagnosed as potential early pregnancies. At period 1, serum progesterone was 85.8% accurate and at period 2, serum progesterone was 95% accurate in detecting pregnant and open animals. Serum estrone sulfate was not effective at period 1, however, was 100% accurate in detecting pregnant versus open animals at period 2, if a criteria of <176.9 pg/ml for open animals and >423.6 pg/ml for a pregnancy diagnosis is utilized. Serum PSPB was 100% accurate in detecting pregnant and open animals at period 2, but was not detectable in any cows at period 1.

Experiment 2. Fifty-five sika does being maintained on a West Texas farming operation (Game Ranching Inc., Ingram, TX) were artificially inseminated (AI) with elk and sika x elk

hybrid bull semen. Blood samples were collected at AI and at 28 and 48 days post-AI. In addition, ultrasonography was performed at day 48 post-AI to confirm pregnancy status. Serum progesterone (ng/ml) was similar between pregnant (1.1±.2) and open (1.3±.1) does at AI. At day 28 and 48, progesterone was higher in pregnant does (5.6±.5 and 73.7±.7, respectively) than in open does (3.7±.4 and 3.3±.3, respectively). Serum estrone sulfate (pg/ml) was not detectable in pregnant or open does until day 48 at which time pregnant does (1999.6±255.8) had higher estrone sulfate concentrations than open does (1248.3±286). Serum PSPB was detectable in pregnant does at day 28 and 48 post-AI and was non-detectable in open does.

Experiment 3. Ten fallow does (provided by Heart-Bar Deer Farms, Inc., Hondo, TX) were synchronized using intra-vaginal progesterone releasing devices and blood samples taken every 2 to 3 days, following 7 days of buck exposure, until day 90 post-breeding and at day 200 post-breeding. Progesterone profiles for pregnant does demonstrated that after day 20 progesterone concentrations continued to rise, while in open does progesterone decreased until the next reproductive cycle. Estrone sulfate may be most effective when used after day 83 post-breeding when concentrations become considerably higher (>3000 pg/ml) than in open does (<230 pg/ml). Pregnancy-specific protein B first appeared in the blood at day 24 to 27 post-breeding and remained detectable throughout gestation. In open does PSPB was not detectable.

Application. When breeding dates are known, as is the case when artificial insemination (Experiment 2), embryo transfer or synchronized natural matings (Experiment 3) are utilized, serum progesterone, estrone sulfate and PSPB may all provide an effective means for pregnancy detection. When breeding or conception dates are not known (Experiment 1) it may be necessary to compare multiple samples collected during or after the rut to verify the pregnancy status of an individual. Ultrasonography has an advantage relative to the other methods in that it provides an immediate result in terms of pregnancy status. Ultrasonography, however, requires trained personnel and may not be cost effective or currently available to most producers or wildlife managers. Therefore, blood sampling, coupled with a reliable, predictable hormone assay, a service provided by most diagnostic laboratories, may provide a more cost effective and practical method for pregnancy diagnosis.

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