Effects of Ovulation-Inducing Drugs on Pregnancy Rates of Cattle in Rural Areas after Synchronized Oestrus and Artificial Insemination

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A dissertation submitted to the Institute for Rural Development (IRD) in fulfillment of the requirements of the Master in Rural Development Degree

(MRDV)

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South Africa

August 2015

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ABSTRACT

The effect of hormones that play a role during ovulation in the cow, like oxytocin, prostaglandin $F_{2\alpha}$ (dinoprost $PGF_{2\alpha}$) and human chorionic gonadotropin (hCG) were used to increase the ovulation rate, therefore pregnancy rates, when injected intramuscularly at the time of artificial insemination (AI). Frozen-thawed Bonsmara and Nguni semen was used in synchronized cows of different ages, breeds and body condition scores (BCS). The main objective of this study was to evaluate the effect of oxytocin, $PGF_{2\alpha}$ and hCG on the animal's fertility measured as conception rates (CR) and to improve cattle genetics in the rural communities of Vhembe district by the use of AI. A total of 205 beef cattle (142 cows and 63 heifers) were used in this study. Cows and heifers were synchronized in groups by inserting CIDRs in the vagina with 2 mg of oestradiol benzoate (Cidirol) intramuscular injection on day 0 of synchronization. On day 6 in the afternoon, females were injected with 25 mg prostaglandin $F_{2\alpha}$ (dinoprost Lutalyze). On day 7 in the morning the CIDRs were pulled out of the vagina and in the afternoon the females were injected with 2 mg of oestradiol benzoate (Cidirol). During day 8 to 9 signs of possible oestrus were visually observed by cattle owners three times a day for a minimum of 30 minutes a time. From day 9 to 10, AI was performed following the AM/PM rule by the same technician using good quality frozen-thawed semen 12 hours after the beginning of standing oestrus. Cows and heifers were alternately assigned to one of the three ovulation inducing drugs: 300 IU hCG (Chorulon), n = 52; 25 mg $PGF_{2\alpha}$ hormone (dinoprost Lutalyze), n = 49; 50 IU oxytocin hormone (Fentocine), n = 46; or 5 ml sterile isotonic (saline) as a control, n = 58. The pregnancy results between the three ovulation inducing drugs and sterile isotonic saline were statistically analyzed using General Linear Model (GLM) procedures of minitab (minitab 2013) using 2 × 4 factorial in a completely randomized design. The treatment means were compared using Tukey's post hoc test. Significant was set at $p<0.05$. On average the control treatment had the highest pregnancy rate followed by hCG, $PGF_{2\alpha}$ and oxytocin respectively, across all the age groups data, although this was not significantly different ($p>0.05$). Pregnancy rate was lowest in the animals that received oxytocin and was significantly different from the other three treatment ($p<0.05$). Other factors such as semen breed and body condition score did not significantly affected the pregnancy rates ($p>0.05$). Thus, there was no improvement in pregnancy rates among communal beef cattle by administering hCG, oxytocin and $PGF_{2\alpha}$ at the time of artificial insemination in the present study.

Key words: Oestrous synchronization, AI, hCG, $PGF_{2\alpha}$, Oxytocin, BCS and pregnancy rate.