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Olorunleke S.O.^{1,2}, Olagbaju, O.T.^{2,3}, Ajayi A.O.^{3,6}, Olojo D.S.^{2,4}, Ikpe A.B.^{2,5}, Yusuf A.², Ayoola M.O.³

¹Department of Animal Science, Ebonyi State University, Abakaliki, Nigeria

²Real People Concept Cattle Hub, Ibadan, Oyo State, Nigeria

³Bowen University, Iwo, Osun State, Nigeria

⁴Department of Theriogenology and Production, Ahmadu Bello University, Zaria, Kaduna State

⁵Department of Theriogenology, University of Abuja, Nigeria

⁶National Centre for Genetic resources and Biotechnology, Nigeria

Oestrous synchronization and artificial insemination (AI) have been identified as key assisted reproductive technology tools in the breed improvement and livestock transformation agenda in Nigeria. This study aimed at demonstrating the efficiency of the Ovsynch protocol and double dose of prostaglandin F₂ α (PGF₂ α) administered 11 days apart in the two major breeds (Sokoto Gudali and White Fulani) of cattle in Nigeria. Sixty cows comprising 30 Sokoto Gudali (Bokolo) and 30 White Fulani (Bunaji) with a history of calving were selected for the study. On days 0, 7 and 9, GnRH, Prostaglandin F₂ α and GnRH were administered to the first group (group A) while the second group (group B) received PGF₂ α on days 0 and 11 respectively. Blood for the hormonal assay was collected from the jugular vein aseptically on days 0, 7, 9, 11, 12, 13, and 14. The vaginal electrical resistance (VER) profiling with the Draminski oestrous detector commenced 24 hours after the second GnRH and PGF₂ α injection for groups A and B respectively. The VER reading was taken twice daily until the time of insemination. The follicular dynamics were done using the Draminski Animal Profi 2 ultrasound scanner and the follicular sizes were measured daily until the Graafian follicle ruptured. The conception rate was determined 50 days post-artificial insemination procedure. The mean blood oestrogen levels ranged from 54.5 to 121.7 pmol/L and 30.7 to 111 pmol/L for cows in groups A and B respectively. The mean blood progesterone levels ranged from 0.7 to 5.5 nmol/L and 1.7 to 8.5 nmol/L in group A and B cows respectively. The vaginal electrical resistance pattern in both breeds was similar; however, the predicted time of ovulation varied greatly between breeds regardless of the synchronization protocol used. The sizes of the follicles in Bunaji were relatively larger than those of the Bokolo breed. The time duration between the last hormonal treatment and the time of ovulation/ insemination varied greatly

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from the standard Ovsynch protocol and between breeds. In general, the conception rate varied between the breeds, with 95.23% and 75% conception achieved in Bunaji and Bokolo breeds respectively.

We observed that cows in group A ovulated after 72 and 84 hours for Bunaji and Bokolo breeds of cows respectively, hence the fixed time AI of Ovsynch protocol should be either modified (from 8 – 20 hours to 72 – 96 hours) or each cow should be individually profiled if pregnancy is desired in these indigenous breeds of cows.

Keywords: Artificial Insemination, oestrus synchronization, follicular dynamics, ultrasonography, Nigerian cattle breed