# Pattern and manipulation of follicular development in Bos indicus cattle

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## RESUMEN

Bos indicus cattle are widespread in tropical regions due to their adaptation to these environments. Although data on reproductive performance have indicated both inferior and superior results for B. indicus cattle, there is little doubt that B. indicus cattle are superior than Bos taurus cattle when they are both kept in tropical or subtropical environments, where stressors like hot temperatures, humidity, ectoparasites and low quality forages are greater. Reproductive endocrinology and oestrus behaviour of the B. indicus cattle have been studied for over 30 years; however, the application of technologies such as real time ultrasonography and Heat-Watch systems has expanded our knowledge on the ovarian follicular-wave dynamics during the oestrous cycle and the time of ovulation. Ovarian follicular dynamics in B. indicus cattle is characterised by the occurrence of two, three or sometimes four waves of follicular development. While dominance is similar to that in B. taurus cattle, maximum diameters of the dominant follicle and CL are smaller than those reported in B. taurus and are probably due to a lower capacity for LH secretion than in B. taurus. Duration of oestrus is approximately 10 h and the interval from oestrus to ovulation is about 27 h. However, the variability in response to prostaglandin F2α (PGF) treatments and the difficulty for oestrus detection in B. indicus cattle have limited the widespread application of artificial insemination (AI) and emphasizes the need for treatments that control follicular development and ovulation. Follicular-wave development in B. indicus cattle can be controlled mechanically by ultrasound-guided follicle ablation, or hormonally by treatments with GnRH or oestradiol and progestogen/progesterone in combination. Treatments with GnRH plus PGF and a second GnRH (synchronization protocol known as Ovsynch) or oestradiol benzoate (known as GPE) have resulted in acceptable pregnancy rates after fixed-time AI (FTAI) in cycling cows, but results were lower in heifers and cows in postpartum anoestrus. Alternatively, treatments with oestradiol and progestogen/progesterone releasing devices resulted in synchronous

emergence of a new follicular wave, and a second oestradiol or GnRH treatment after device removal resulted in synchronous ovulation and acceptable pregnancy rates to FTAI. Furthermore, oestradiol and progesterone treatments combined with eCG (given at the time of device removal) increased pregnancy rates in suckled B. indicus cows and may be useful for the treatment of cows in postpartum anoestrus. In summary, exogenous control of luteal and follicular development facilitates the application of assisted reproductive technologies in B. indicus cattle by offering the possibility of planning AI programs without the necessity of oestrus detection and without sacrificing the overall results.

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