

SUPEROVULATION IN BUFFALOES: CONSTRAINTS AND MANIPULATION

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Superovulation (SO) and embryo transfer (ET) technologies have played an increasingly important role in the genetic improvement of cattle as they aim at faster multiplication of elite livestock. However, the application of these technologies in buffaloes has yielded much more limited success. Average number of recovered embryos per donor is often <2, with number of transferable embryos per donor averaging <1.0.

Various factors contribute to the low response to SO in buffaloes. The most limiting factor appears to be the relatively smaller numbers of primordial and graafian follicles in the ovary in buffaloes, being about 50% of those in cattle. The reserve of mobilizable primordial follicles diminishes at a faster rate with advancing age in buffaloes than in cattle due to higher rate of atretion (70-80% v. 50%). Timing of gonadotropins treatment affects response to SO with larger number of ovulations resulting from treatment at late than at early or mid luteal phase. In the absence of dominant follicles at time of SO initiation, a larger number of ovulations was achieved compared to that at its presence. There is evidence of individual variation in the pattern of follicular dynamics during the oestrous cycle, with about 60% of buffaloes having two waves of development. This suggests the possibility of manipulating response to SO when timing is determined with the aid of ultrasonographic scanning.

Type of gonadotropins used affects response to SO, with FSH yielding more favourable results than PMSG, in terms of larger number of embryos recovered or higher proportion of transferable embryos.

Few studies reported on seasonal variation in the response to SO in buffaloes, with a pronounced effect on the quality of embryos produced.

Characteristics of preovulatory endocrinological changes may also play a role in the poorer response to SO treatment in buffaloes than cattle. These include lower oestradiol concentration, lower luteal progesterone concentration and lower preovulatory LH peak. To overcome difficulties in embryo production *in vivo* in buffaloes, other methods have been suggested. These include oocyte aspiration either *in vivo* or *in vitro*, followed by *in vitro* maturation and fertilization. However, blocks in the development of these technologies for buffaloes are, at present, far from being fully elucidated.