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# Incidence and etiologies of Repeat breeding in buffaloes

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## *Abstract*

Repeat breeding is one of the important infertility problems that occur in buffaloes. Repeat breeding increases service period and inter-calving interval thereby causing low milk and calf production resulting in greater economic losses to the dairy industry. A buffalo that does not become pregnant after three or more breeding is considered a repeat breeder. Repeat breeding can be a failure of fertilization and early embryonic death. Ovulation abnormalities, anatomical abnormalities and endometritis are the female factors associated with failure of fertilization. Age, season and poor semen quality are the bull factors while improper insemination time is a technician factor causing failure of fertilization. Early embryonic death refers to the death of fertilized ova and embryos within the first 2-3 weeks of gestation due to low luteal progesterone concentration, poor corpus luteum development and heat stress during the summer season.

## Introduction

Repeat breeding is one of the main reproductive disorders that affect productivity in buffaloes. A repeat breeder is defined as a cow or buffalo that has less than 10-year-old, have a normal estrous cycle, apparently free from palpable clinical abnormalities, has no abnormal vaginal discharge and calved at least once but failed to conceive even after 3 or more consecutive mating with fertile bull or inseminated using fertile semen (Robert, 1971). The incidence of repeat breeding is low as compared to cattle. The cause of repeat breeding is multifactorial. The etiologies of repeat breeding can be a failure of fertilization and early embryonic death.

## Incidence

The incidence of repeat breeding is low (5.40%) in buffaloes. The age of buffaloes in terms of parity had not any significant effect on repeat breeding. Furthermore, the incidence in buffaloes was reported higher (8.22%) in autumn and lowest (2.95%) in the summer season. The report showed that the incidence of repeat breeding was highest (6.57%) among the buffaloes kept by marginal farmers and lowest (4.36%) among the buffaloes of large farmer categories.

## Etiology of repeat breeding

The etiology of repeat breeding is unclear and multifactorial. Repeat breeding in buffalo can be a failure of fertilization and early embryonic death.

**A) Failure of fertilization:** Failure of fertilization comprises 10%–20% of pregnancy losses during the first 21 days post-insemination in cattle however data is not available for buffaloes. The possible causes of failure of fertilization can be the female factor, male factor and technician factor.

### i) Female Buffaloes:

- **Ovulation abnormalities**: Delayed ovulation, anovulation and ovarian cyst less frequently occur in buffalo but can cause fertilization of fertilization
- **Anatomical abnormalities**: Hydrosalpinx, pyosalpinx, salpingitis and stenosis or growths in the oviduct probably prevent fertilization buffalo. Ovarobursal adhesions have also been reported in some cases that affect fertility.
- **Endometritis:** The reported clinical incidence of endometritis appears to be very high (2.4%–20.68%) in buffaloes. Endometritis affects fertility by bacterial endotoxins or indirectly by inflammatory mediators such as cytokines, nitric oxide and oxidative stress affecting sperm, ovarian, uterine and embryonic function. A high proportion (70.59%) of buffaloes with clinical endometritis is reported to suffer from ovarian inactivity.

### ii) Bull factor:

- **In/ subfertile spermatozoa:** Repeat breeding can be originated from bull and semen. The age and season of buffalo bull affect the semen volume and concentration. The bull breed, semen type (liquid or frozen), quality and source have marked effects on the conception rates.

### iii) Technician factor:

- **Improper insemination time:** With the advancement of new technologies, the use of AI techniques in buffaloes has been increasing. Poor estrus detection, incorrect time of insemination and wrong site of insemination using AI affects fertility. The conception rate varies among the inseminators and the report showed that incorrect inseminations concerning estrus were performed in 30.67% of buffaloes. Repeat breeder buffaloes at insemination had more than 1 ng/ml plasma progesterone concentration suggesting that buffaloes were inseminated at the wrong time.

**B) Early embryonic death:** Embryonic death refers to the death of fertilized ova and embryos within the first 2-3 weeks of gestation. Low luteal progesterone concentration, poor corpus luteum development and heat stress during the summer season were responsible for embryonic mortalities in buffaloes. Infectious

agents were mentioned only for 2%–8% of the embryonic losses in buffaloes. A seasonal increase in embryonic deaths during the non-breeding season has been reported in buffaloes.