

Semen collection and Artificial Insemination in Mithun: A success story

Mithun (*Bos frontalis*) is heavily build livestock specie found in hilly regions of Arunachal Pradesh, Nagaland, Manipur and Mizoram at an altitude ranging from 300 – 3000 MSL. Mithun is traditionally reared under free range forest based system where no inputs are given in the form of feed or medication. Due to diversification of agriculture and shrinkage of forest area, Mithun farmers are gradually shifting towards more remunerative agricultural crops. In order to conserve and popularize the Mithun population. Two important phenomenons have been noticed in the Mithun in recent years:

1. Decrease in adult body size.
2. Longer Inter-calving interval

It has been found through survey and interview with the farmers that this may be due to inbreeding in Mithun for several generations. There is a phenomenon of dominance in male Mithun and all the female in a herd is bred by dominant male due to continued inbreeding several years resulted in infertility problems and reduction in body size.

In order to overcome this problem, ICAR-NRC on Mithun initiated an institute project on semen collection and AI (Artificial Insemination) in Mithun) in 2014.

Problems in Mithun semen collection:

Mithun is very shy breeder. Reproductive behavior is very less pronounced both in male and female Mithun. Male Mithun generally do not mount over the female Mithun under confinement. Similarly, female Mithun cows do not show estrus behavior like bellowing, secretion of vaginal mucus, frequent urination and mounting etc. Therefore, mounting of Mithun bull over the dummy/female Mithun was biggest hurdle in collection of semen through AV method.

A training schedule was developed to train the Mithun bull for mounting.

1. **Use of estrus Mithun cow as dummy:** At the initial stage, estrus Mithun cows were identified through regular monitoring and visual examination. Mithun cows in estrus were brought to the collection crate and the bull was exposed to the female. After 15 min of exposure, another bull was tried. This training schedule was continued for one month. Reproductive and mounting behavior of Mithun bull was recorded. After 30 days of exposure, bulls started mounting over estrus female Mithun and successful collection of semen was done through AV method.

2. **Sprinkling of estrus urine over non-estrus female Mithun:**

Once the bulls are trained to mount over estrus female, non estrus female Mithun was used as dummy but bulls did not show any interest. Later, urine was collected from estrus Mithun cows and stored at 5 °C in refrigerator. Non estrus Mithun cows were sprinkled with estrus urine in the perennial region and bulls were exposed to mount. Exposure time for each bull was fixed for 15 min. This training was continued for 30 days. Within 30 days time most of the bull mounted over the dummy and semen was successfully collected.

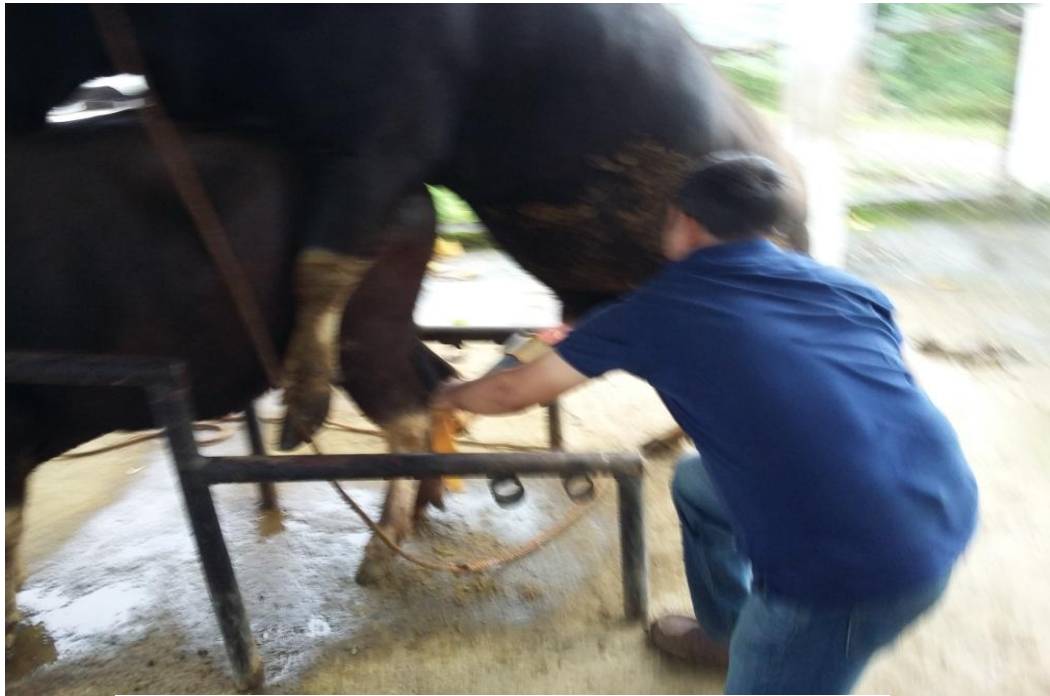
Artificial Insemination under farm and Field condition:

In order to keep proper record of the sire, artificial Insemination was initiated at Institute Mithun Farm, ICAR-NRC on Mithun. In order to avoid the time consuming and labor intensive heat detection process, estrus synchronization and timed AI was practiced. Co-synch protocol was used to bring the animals in heat. Estrus synchronization and timed AI was initiated at Institute mithun Farm since 2016 and till date more than 60 mitun calves were produced.



Training of mithun bull for semen collection by AV method





Semen collection in Mithun by AV method



Artificial Insemination in Mithun



(Mithun calves born through Artificial Insemination)

Mithun semen preservation was initiated by ICAR-NRC on Mithun in the year 2010. Earlier mithun semen was collected by rectal massage method and preserved under refrigerated condition (4 °C) after dilution but the limitation was that the quantity and quality of semen obtained through rectal massage method was very poor and such semen cannot be preserved more than 48 hours with good fertility of spermatozoa. Therefore, later semen freezing (cryopreservation at -196 °C) using static vapour freezing technique was initiated with slight improvement. Since, there is no control over the cooling rate in static vapour freezing method, there was a significant batch to variation in post-thaw quality of semen. In order to avoid this variation, controlled freezing of mithun semen started in 2015 using Bio-freezer. From 2016 onwards, semen is being collected by AV method and frozen under controlled freezing condition which resulted in significant improvement in post thaw quality of mithun semen. We have more approximately 4500 frozen semen dosed in stock which is being used for AI in mithun.