

Enhancing fertility at early ages

in heifers by supplementing critical nutrients of reproduction

**A Arangasamy*, D T Pal, Letha Devi, L Niketha, A Mech, S Senani,
M A Kataktalware, G B M Reddy, K Giridhar and Raghavendra Bhatta**

Krishi Vigyan Kendra, Sas Nagar, Mohali, Punjab 160 055

Dairy heifers are an overlooked profit opportunity as rearing them from birth to their first calving is one of the inflated operations in a dairy farm. Raising heifers to making them pregnant early by advancing the age of puberty, reduces investments and thus is profitable. Heifer failing to conceive after attaining puberty and repeated inseminations is one of the primary impediments for livestock holders. An attempt was made in which heifers (not conceived even after 4–5 inseminations however attained puberty) were supplemented with ICAR-NIANP critical minerals along with Vitamins, Tonophosphan and deworming for duration of 30–90 days showed a tremendous gain in terms of estrus induction and conception in heifers, repeat breeders and anoestrus cows. These kinds of practices could be adopted in dairy heifers to improve the fertility with minimum treatment cost by the dairy farmers with the help of veterinary officers to advance the age at first calving in heifers..

Keywords: Anoestrus, Cow, Conception, Heifer, Mineral, Repeat breeder, Vitamin

REPRODUCTIVE process is intimately connected to nutrition, environment and energy status of the animal. The major problems faced by the dairy farmers are delayed onset of puberty, required more number of inseminations per conception and occurrence of first calving at later age in heifers. This will lead to huge economic loss to farmers as well as reduction in average progeny production in dairy cow's life span. The normal duration of puberty attainment in cattle is about 15 months (range 10–24 months) and age at first calving is about 30 months (24–36 months). Available literature indicates that, dietary deficiencies and imbalances of minerals can result in poor growth, failure of reproduction and many other disorders in dairy heifer. All these issues lead to major economic recession to dairy farmers. Supplementation of mineral advanced the puberty attainment in prepubertal heifers

and bulls. Organic mineral supplementation resulted in puberty attainment earlier in male goats, better sperm binding ability to oocyte surface and enhanced cleavage rate. Therefore, a study was carried out to assess the supplementation of critical nutrients for reproduction effects in attainment of estrus and conception in heifers at early stage and treat the repeat breeder and anoestrus dairy cows. Further to develop a package of practices to solve the problems faced by rural dairy farmers.

Heifer, repeat breeder and anoestrus cow selection and treatment

The present study was initiated with our previous survey data collected from selected villages of Dodballapura Taluk under ICAR sponsored Farmer FIRST project. Our objective was to accelerate the age for first pregnancy through supplementing critical nutrients supplement (ICAR-NIANP formulation),



Checking of heifer



Distribution of mineral mixture to owners



Pregnant heifer with owner



Pregnant heifer with owner

and administration of vitamins (AD3E) and through deworming programme. A total of 33 dairy heifers (Treatment group; 20 heifers and Control group; 13 heifers) were selected for a minimum 30 days to maximum 90 days duration of treatment. Rectal examination was carried out in all selected animals. Treatment groups were administered with deworming tablet at only on day 1 (Fenbendazole 1.5 g Bolus) followed by parenteral injection of (i/m) 10 ml each of AD3E and Tonophosphan (AD3E: A 250000 IU, D 25000 IU, E 100 IU; Tonophosphan: Sodium salt of 4-dimethylamino-2-methylphenyl-phosphinic acid 0.2 g/ml) on day 1, 30 and 60, respectively. The critical nutrient supplement was fed orally @100 g/day/cow for 30–90 days along with normal feeding pattern of dairy cattle. Heifers in the control group did not receive any of these treatments. The repeat breeder (53) and anoestrus (26) dairy cows diagnosed through rectal examination along with history at the organized health camp were also included in this study. The similar type of treatment was given for the repeat breeder and anoestrus cow followed for heifer cows.

Through comparative study, it was observed that animals of treatment group supplemented with critical nutrients conceived (3 heifers in 30 days, 4 in 60 days and 8 in 90 days) earlier than the control group animals, except 5 heifers out of 20 treated animals which came to estrus but couldn't conceive even after 90 days of treatment. The repeat breeder and anoestrus dairy cows were responded very well to the above mentioned treatment protocol and conceived 79.24% of repeat breeder cows (42/53) and 80.76% of anoestrus animals (21/26), respectively. Mineral supplementation enhances the blood biochemical components as well as helps in regulation of synthesis of reproductive hormones, subsequently normalises the oestrus cyclical activity. Supplementation of trace mineral has been shown to enhance fertility in cattle, possibly by reducing embryo death. The cost of treatment ranged from ₹267–645/animal (₹267 for 30 days, ₹417 for 60 days and ₹645 for 90 days). The average input cost of supplementation was ₹489 per animal. The cost economy and economic benefits in our intervention was calculated to be ₹1.55 lakhs up to pregnant stage and ₹6.0 lakhs on lactation period of 200 days.

Advantages of supplementation of Vitamins AD3E and Tonophosphan and deworming

- Deworming leads to reduction in worm loads and

helps for better absorption of nutrients at intestinal tracts.

- Vitamin AD3E favours for revitalisation of the reproductive tract, proper maintenance of lining of uterine endometrium, for successful implantation along with stimulation action of folliculogenesis and quality oocyte production.
- Phosphorous (Tonophosphan) is recorded as fertility mineral; it was observed that monthly supplementation enhanced the conception rate.
- This package of practice like supplementation of vitamins, critical nutrients for reproduction and deworming at regular intervals has a role in regularizing the balance of metabolomics, supporting the steroidal hormone production and maintenance of conception in heifers.
- Heifer fertility is inherently better than that of lactating cows but poor management can still result in poor fertility in heifers.

Henceforth, to optimize fertility and lifetime productivity of heifers and for economical upliftment of farmers this method of nutritional and physiological intervention may be recommended in the field.

SUMMARY

This study was aimed to advance the pregnancy and conception in heifer, repeat breeder and anoestrus cow. ICAR-NIANP critical nutrient formulation with combination of vitamins and Tonophosphan along with deworming was attempted. In overall 75% animals (15/20) conceived in treated group compared to 23% animals (03/13) in control group within 90 days of treatment period. The repeat breeder and anoestrus dairy cows responded very well to the above mentioned treatment protocol and 79.24% of repeat breeder cows (42/53) and 80.76% of anoestrus animals (21/26) conceived, respectively. Supplementation of trace mineral has been shown to enhance fertility in cattle, possibly by reducing embryo death. The practice of combined treatment for early pregnancy in heifer and conception of repeat breeder and anoestrus cow with critical minerals, vitamins and Tonophosphan along with deworming schedule has improved the fertility with minimum treatment cost.

*Corresponding author's e-mail: arangasamyars@gmail.com