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Estrous synchronization in infertile dairy cows and buffaloes: A field study from Bharuch District of Gujarat State

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Abstract

The present study was planned to analyse the results of estrous synchronization protocol adopted for the infertile dairy cows and buffaloes belonging from Bharuch and Vaghara blocks of Bharuch district in Gujarat state. For this study data were collected from the animal general health checkup camps were held under the jurisdiction of three Cattle Development Centres (CDC) which were operated by the BISLD West region Vadodara. During the year 2023 and 2024 total eight animal health checkup camps were held for 200 animals in this 162 were buffaloes and remaining 38 were cows. The animal health checkup camps were held in the months of January, February, March, May, July, August, October and December. These animals were owned by 107 farmers spread over 13 villages in Bharuch and Vaghara tahsils of Bharuch districts in Gujarat State. The estrous synchronization results revealed that out of 38 cows 17 cows were noticed confirm pregnant with average conception rate as 44.74 per cent. In buffaloes, out of 162 buffaloes 44 were recorded pregnant with average conception rate of 27.16 per cent. Asset valuation of conceived animals by using estrous synchronization protocol was done after interaction with farmers which was Rs. 34.05 lakh and if not conceived it may be around Rs.7.87 lakh. Apart from this these successfully conceived animals may contribute to increase in milk production in 13 villages, 2200 Liters per animal which may cost Rs. 60.39 lakhs.

Keywords: Estrous synchronization, cows, buffaloes, synchronization season, asset value. Bharuch district

Introduction

Fertility in dairy animals is totally dependent upon agroclimatic condition, cropping pattern and adoption of good management practices viz. housing, feeding and preventive health care. Among the major causes of bovine infertility nutritional infertility is the major one for resource poor farmers followed by functional and Infectious. Nutritional infertility is mainly linked with the deficiencies of micro and macro minerals in dairy animals apart from this underfeeding exerts vitamin deficiencies and protein imbalance resulting to issues like delayed ovulation, anoestrous and repeat breeding which causes low conception. Bharuch district is known for its industrial estate and due to industrialization Gauchar land is limited for animals of Vaghra and Bharuch blocks. Buffalo population is dominated in Vaghra and Bharuch blocks and due to industrialization maximum farmers from these blocks are resource poor. Steady decline in fertility of dairy animals is being seen. In the face of this decline in fertility performance hormones have been advocated and increasingly been deployed to assist breeding. Hormonal interventions have been used to increase the probability of estrous detection and insemination, and to increase pregnancy rates of dairy cattle under a variety of management systems.

Material and Methods

The A.I. program in Bharuch district of Gujarat state is being operated by BISLD West region with financial support from the Adani foundation, Dahej and BAIF is performing the role of the service provider.

During the year 2023, the infertility and general health checkup camps were organized in the month of February, March, July, August, October, December and in the year 2024 such camps were again arranged in the month of January, May and December. These animal health checkup camps were undertaken in the jurisdiction of Dahej, Manad and Kadodara Cattle Development Centres in Vaghara and Bharuch Tahsils of Bharuch districts in Gujarat state. The objective of this study was to breed infertile animals who were economic burden to the farmers as rearing of infertile animals for longer duration on livestock holding families.

Animals and their management

The animals were maintained and reared by the farmers individually. The housing ranged from open to permanently constructed sheds. Animals were semi-stall-fed with dry and green fodder along with some concentrate feeds. Total 200 animals covering 38 cows and 162 buffaloes owned by 107 farmers spread over 13 villages were physically checked. The village-wise animals diagnosed for general health checkup indicated that 17.50% animals were from Koliyad village, followed by 13% from Megham, 11% Janiydara, 10.50% from Nandharkha and below 10% from remaining eight villages (Table 2). All these animals were breed-able and were not able to conceive either by natural service or repeated more than three time by doing artificial inseminations from the last one to two year.

Management of animals before synchronization protocol

All these animals were physically examined per rectally to know any defect in reproductive organ. Before giving hormonal treatment as prescribed in heat synchronization protocol, mineral and vitamin supplements of 80-100 gm/day with 1 to 2 kg. Concentrate per animal was given for at-least 3 months to overcome problem of mineral deficiencies.

Animal health camp season

The animals' general health checkup camps were held as per the farmers' time availability especially sparing the agriculture farming operations like sowing, harvesting, agriculture produce marketing etc. The months in which such animal general health checkup camps were held were divided into three seasons as Rainy (July to October), winter (November to February) and summer (March to June). It was noticed that maximum (75%) animal health checkup camps were held in rainy season (Table 2).

Synchronization protocol

All these animals were injected with GnRh and PGF2 alpha as per the standard protocol of heat synchronization on 0, 7th and 9th day and then insemination was done on 9th day evening and in morning hours on 10th day with or without showing the heat symptoms by the animals. Pregnancy diagnosis of all the synchronized animals was done three months after the date of

insemination by rectal palpation.

Results and Discussion

During these general animal health camps total 200 animals were examined physically and treated with estrous synchronization protocol. In these 200 animals, 38 were cows and 162 were buffaloes (Table-2). After rectal examination for pregnancy confirmation out of 38 cows 17 cows were noticed confirm pregnant with average conception rate as 44.74 per cent. In buffaloes, out of 162 buffaloes 44 were recorded pregnant with average conception rate of 27.16 per cent. The lower conception rate in buffaloes compared with cows might be because of buffaloes are known to have a preponderance of two wave cycle and a lower number of follicles are recruited per follicular wave (Campanile *et al* 2010; Baruselli *et al.*, 2013) ^[2, 1] the probability of buffalo returning to estruses following PG administration is lower compared to cows.

Synchronization Season

The distribution of animals under study showed that 75% animals were present for general checkup in rainy season, followed by 18.50% in winter season and remaining 6.50% animals in summer season (Table-2). The season wise synchronization results indicated that cows synchronized in winter season conceived more (44.44%), followed by rainy season (38.89%) and in summer season only two cows were synchronized and both were conceived. In buffaloes synchronised results were different compared with cows and it was noticed that buffaloes synchronized in winter season were conceived more (47.37%), followed by summer season (36.36%) and rainy season (23.48%). The season-wise variation in conceptions observed both in cows and buffaloes might be due to day's postpartum (Usmani, 2001) ^[5], nutritional status (Hussein and Abdel-Raheem, 2013) ^[4] and others that regulate effects of prostaglandins, an important determinant appears to be the season of hormone administration. The scientist Chohan *et al.*, (1993) ^[3] noticed that administration of a single PG to buffalo heifers resulted in estrus rates of 60% during the low breeding season with poor subsequent conception rates (22.8-25.6%), whereas, during the breeding season estrus rates were 86.6% and conception rates varied from 47.8 to 53%.

Impact of synchronization

Productive animals are always valued on higher side whereas unproductive animals are having negligible prices and most of them must go under butcher knives, especially buffaloes. Asset valuation of conceived animals was done after interaction with farmers which was Rs. 34.05 lakh and if not conceived it may be around Rs.7.87 lakh. Apart from this these successfully conceived animals may contribute to increase in milk production in 13 villages, 2200 Liters per animal which may cost Rs. 60.39 lakhs. The details are given in Table 1.

Table 1: Valuation of synchronized animals

Particulars	Before pregnancy / Animal (Rs.)	After pregnancy /Animal (Rs.)	No of conceived animals	Total valuation (Rs.)
Cow	7500	45000	17	765000
Buffalo	15000	60000	44	2640000
Total			61	3405000
Milk cost				6039000

Table 2: Variables under study

Specification	Buffalo	Cow	Grand Total	% Coverage
Month of synchronization				
January	5	9	14	7.00
February	13	5	18	9.00
March	8	2	10	5.00
May	3		3	1.50
July	14	3	17	8.50
August	62	10	72	36.00
October	56	5	61	30.50
December	1	4	5	2.50
CDC's under study				
Dahej	56	6	62	31.00
Kadodara	40	13	53	26.50
Manad	66	19	85	42.50
Synchronization season				
Rainy	132	18	150	75.00
Summer	11	2	13	6.50
Winter	19	18	37	18.50
Villages under study				
Bhadbhut	5	2	7	3.50
Bhuva	9	1	10	5.00
Janiyadra	15	7	22	11.00
Kaladra	26	1	27	13.50
Kasva	8	4	12	6.00
Koliyad	30	5	35	17.50
Kothiya	5	5	10	5.00
Manad	13	5	18	9.00
Mehgam	26		26	13.00
Nandharkha	17	4	21	10.50
Nandida		2	2	1.00
Paniyadra	4		4	2.00
Vav	4	2	6	3.00
Total	162	38	200	100

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Conflict of Interest

Not available

Financial Support

Not available

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