REPRODUCTION

Precision in Repeat Breeding management in cattle with the assistance of an Automated Behavior Monitoring System

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INTRODUCTION

Repeat breeder syndrome involves cows failing to conceive after consecutive three or more times of Artificial Insemination (AI) with good quality semen or with natural breeding using a fertile bull. Farmers and Animal Health Practitioners commonly feel incapable of addressing this reproductive issue, and after numerous unsuccessful attempts to conceive, it results in therapeutic expenditure, reduced milk production, and ultimately, culling. Major reason of repeat breeding syndrome is inability to detect estrus or to find out accurate timing of AI aligning with time of ovulation in cow.

OBJECTIVE

The aim of the present study is to improve reproduction efficacy in repeat breeder cows with mineral supplementation, hormonal intervention and improved timing of AI using an automated behavior monitoring system (ABMS).

MATERIALS AND METHODS

The study was conducted at Hargun Dairy Farm, Amritsar, Punjab, India with 56 Holstein Friesian crossbred cows from November 2022 to June 2023. The farm has been facing the challenge of repeat breeding syndrome in 13 (23%) animals since 2021. These animals were artificially inseminated three or more times prior to November 2022 based on visual-observed estrus behavior. The average Days in Milk was 605, the average lactation number was 2, and the average artificial number of inseminations was 4.5 per animal in repeat breeders. All the animals were maintained with the same management and plane of nutrition. The average duration of estrus signs was 3.61 days leading to difficulty in AI timing by Animal Health Practitioners. To improve the reproductive parameters, the farm installed an automated behavior monitoring system (SenseHub™ Dairy, MSD Animal Health) in September 2022. The ABMS transforms animal behavior monitoring into a Heat Index score. The higher the Heat Index, the higher the probability of an animal being in heat. Based on the generated data on estrus behavior and history, the veterinarian diagnosed 13 animals as repeat breeders with ovulatory defects and selected them for treatment. From the first days of treatment, repeat breeder animals were supplemented with the chelated mineral mixture (VMall™ Chelated, MSD Animal Health), 70g daily, orally, for 30 days. A Sodium salt of 4- dimethylamine,2-methylphenyl-phosphonic acid 0.2g (Tonophosphan® Vet, MSD Animal Health), 10mg/kg body weight, was administered i.m. on an alternate days for 10 days. AI was performed at specific times, determined with the assistance of the insights provided by the automated behavior monitoring system that displayed a breeding window of 26 hours and a Heat Index. AI was performed during the later green color part of the breeding window precisely between 10 to 12 hours of the remaining breeding window. At the time of AI, Buserelin acetate (Receptal®, MSD Animal Health) 2.5 ml was administered I.M. Pregnancy diagnosis was done around 45 days post AI by per rectal examination.

Detection of estrus and timing of insemination indicated by an automated behavior monitoring system (SenseHub™ Dairy), mineral supplementation, and hormonal intervention, improved reproductive performance of repeat breeder cows.

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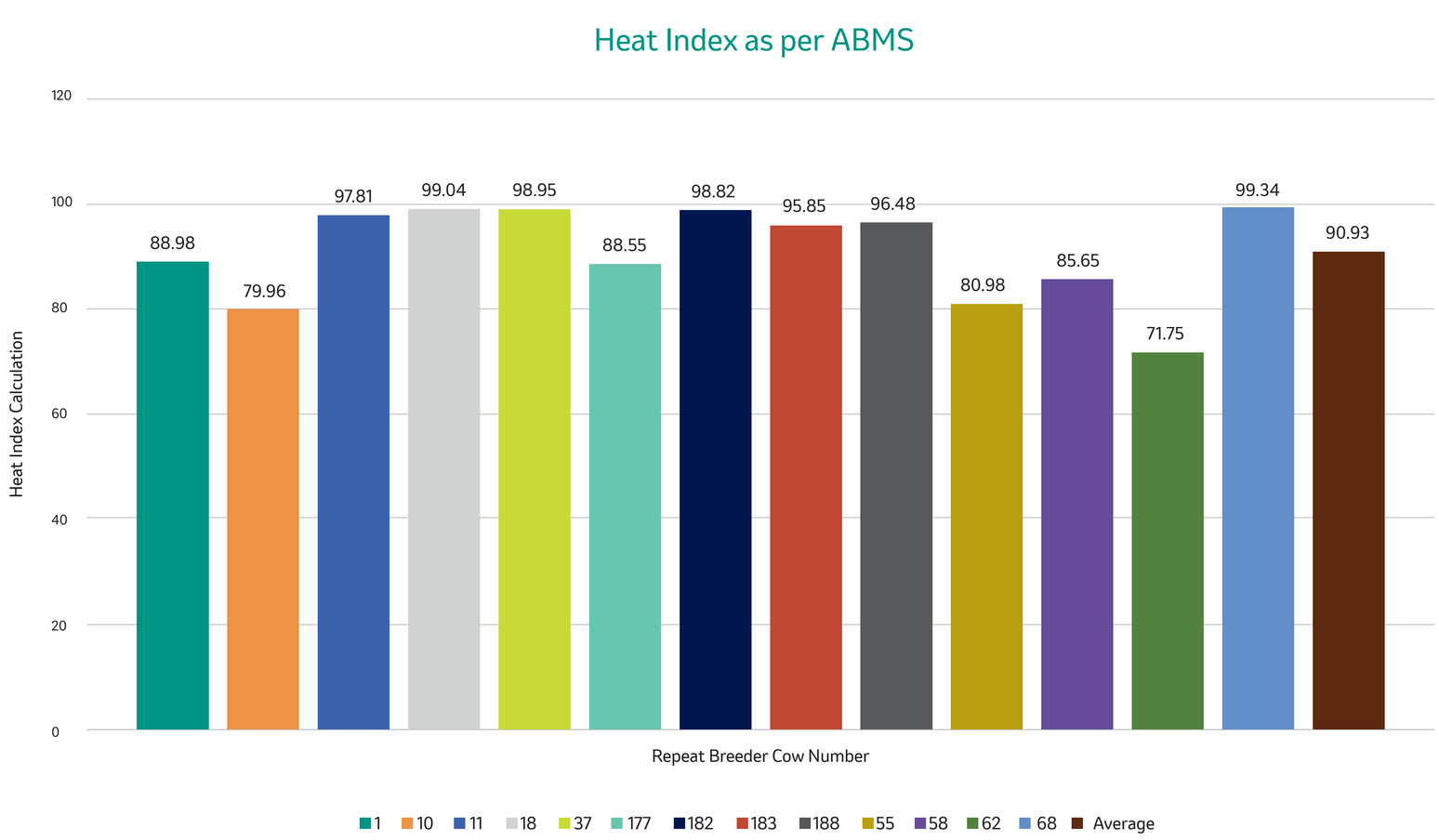
RESULTS

Before mineral supplementation treatment, cows manifested mild estrus behaviors with low Heat index scores and watery estrus vaginal discharge based on visual observation. However, after mineral supplementation treatment, estrus signs were prominently observed with an average Heat Index score of 90.93 according to the ABMS **(Figure 1).** The conception was successfully achieved in all 13 repeat breeder animals following hormonal intervention and precision in artificial insemination timing with the help of an ABMS.

FIGURE 1. Automated Behavior Monitoring System Heat Index calculation at Conceived AI per repeat breeder cows after mineral supplementation and hormonal intervention.



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