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Lactation and seasonal influence on conception rate in Holstein-Friesian upgraded cows

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Abstract

Evaluation of conception rate is the most important measure of herd fertility status. Available information on this aspect in a herd under Indian tropical climatic conditions is meager. Therefore, an investigation was undertaken to evaluate the impact of season on conception rate in Holstein-Friesian upgraded cows at an organized dairy farm. In view of statistical analysis, the whole calendar year was divided into four Seasons viz. Winter (Jan-Feb), Summer (Mar-May) south west monsoon (Jun-Sept) and northeast monsoon (Oct-Dec) seasons. The study revealed the overall conception rate of the herd to be 46.59 per cent (with an overall 2.14 inseminations per conception) while the conception rate for 1st, 2nd, 3rd, 4th, 5th and 6th inseminations were 26.65, 10.62, 4.28, 3.72, 1.02 and 0.27 per cent respectively. Thus one half of the total cows were settled with first service, while rest of those cows required more than one service to conceive. Further, significantly higher ($P < 0.05$) conception rate was obtained during summer (32.57%) and south west monsoon (31.95%) season as compared to 18.46 and 17.01% conception rates obtained during north east monsoon and winter seasons, thus, indicated the effect of season on conception rate. The summer season witnessed significantly higher number of conception.

Keywords: Conception rate, season, Holstein-Friesian upgraded cows

Introduction

Pregnancy in dairy cows is a function of both successful service and conception^[4]. Conception rate is the ratio of number of conceptions to number of services and is expressed as percentage. The calving to service interval has been shown to affect the conception/non-return rate^[6]. Reproductive performance of lactating dairy cows is dependent upon service rate (or estrus detection rate), fertility of the service sire, and maternal fertility^[12]. Standing heat shown by cows could also be influenced by environmental conditions^[15]. Maintenance of satisfactory fertility level is the foremost requirements for successful operation of any dairy cattle breeding programme. Hence, a study was undertaken to evaluate the overall conception rate with the factors affecting it.

Materials and Methods

The present study was taken up to evaluate the overall conception rate under different climatic seasons in Holstein-Friesian upgraded cows. Data on 224 cows were collected from the history sheets of organized dairy farm at Bangalore for a period of five years (1996-2000). To expose the seasonal variation, the calendar year was divided into four seasons based on geo-climatic factors such as minimum and maximum temperature, relative humidity, hours of sunshine as Winter (January to February), Summer (March, April and May), South West monsoon (June, July, August and September) and North East monsoon (October, November and December), seasons. In order to cope-up with the effect of non-orthogonality of the data due to unequal subclass frequencies, method of least square analysis was employed^[6]. The conception rate (CR) was calculated by using the following formula

$$C.R. = \frac{\text{Number of animals conceived}}{\text{Number of animals inseminated}} \times 100$$

Results and Discussion

Overall conception rate

In the present study, the overall conception rate of the herd was estimated to be 46.59 per cent an overall 2.14 inseminations per conception (Table 1).

Conception rate less than 50 per cent reported to seriously affect the economics of the herd. Overall 42.30 per cent conception rate in HF crossbreds and 61.29% in pure HF cows have also been reported [10]. ~Conception rate of 45.60 per cent in HF cows under subtropical climate [8]. Conception rates were lower than the industry target rates. A target rate value for first service conception is 50 to 60 per cent [13].

Similarly another study reported a first service conception rate of 47 per cent [12].

In the present study, the conception rate of 26.65 and 10.62 per cent for first and second inseminations and 4.28, 3.72, 1.02 and 0.27 per cent conception rates respectively were recorded for 3, 4, 5 and 6th inseminations (Table 1).

Table 1: Order of services and conception rate

Particulars	Number of service								Total inseminations
	1	2	3	4	5	6	>7	Total	
Number of animals conceived	286	114	46	40	11	3	573	500	1073
Conception rate (percentage)	26.65	37.27	41.55	45.27	46.29	46.59	-	46.59	-
Cumulative conception rate (percentage)	26.65	10.62	4.28	3.72	1.02	0.27	-	-	-
Overall AI per conception	-	-	-	-	-	-	-	-	2.14

The data presented in Table 1, on conception rate the subsequent services indicated that more than three fourth of the total cows in the herd settled with two services, while rest of those required more than two services to conceive. Similar to the observations made in the present study about three fourth of the total cows in the herd settled with two services only and 4.4 per cent of total cows required six or more services to settle have been reported in Holstein crossbred cows [1].

Further, the present study also indicated that one half of the total cows were settled with first service (Table 1), while rest of those cows required more than one service to conceive [2].

The cows receiving 1st, 2nd, 3rd, 4th, 5th and 6th insemination had a conception rate of 32.5, 17.1, 20.9, 7.7, 14.3 and 0 per cent, respectively as reported in Holstein crossbred cows [1]. The cumulative conception rate at 2nd and subsequent inseminations were 41.5, 47.7, 48.7, 50.0 and 50.0 respectively. Thus, most of the cows (47.7%) conceived up to 3rd insemination and only 2.3 per cent by subsequent insemination in Haryana cows [16], while studies made in USA, indicated the first service conception rate 38 per cent [7]. The first insemination conception rate obtained in the herd investigated was far lower than those reported by the earlier workers. Further, it was observed that the decline in conception rates with progressive increase in services in the present study. It can be concluded that the conception rate in the investigated herd of HF herd cows was quite low and the major contributor to lowered herd fertility. To improve the fertility status, conception rate and heat detection need to be emphasized.

Effect of season on conception rate

Various factors such as season, climate and management are responsible for variation in conception rate. The season of insemination also affects the conception rate.

In the present study, significantly higher ($P < 0.05$) conception rate was obtained during summer (32.57%) and south west monsoon (31.95%) season as compared to 18.46 and 17.01% conception rates obtained during north east monsoon and winter seasons, thus, indicated the effect of season on conception rate. The summer season witnessed significantly higher number of conception. The cows get rid of seasonal stress with gradual transition of the winter into summer because of improved intake of feeds or water, both qualitatively and quantitatively leading to positive energy balances in animals, which is highly required for efficient reproduction to continue [9]. This indicated that the main reason for seasonality of calving lies with heat detection.

Similarly, seasonal variations of conception rates were observed in Blackpied cows [3]. Significantly lower conception rates were observed during north east monsoon and winter seasons and suggested that the incidence of early embryonic death and abortion increased during these seasons. The seasonal variations would be ascribed to fluctuations in temperature and humidity. Increase in temperature and humidity stress might have lowered the conception rate. It is therefore, concluded that the best period for fertile breeding of cows was between early summer and south west monsoon season in tropical climate.

Conclusion: It can be concluded that the best period for fertile breeding of cows was between early summer and south west monsoon season in tropical climate.

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Ethical Matters: The Present study was a part of MVSc. Programme, indicating no ethical issues.

Conflict of interest: All the authors declares that they have no conflict of interest

References

1. Arunkumar. Conception rate in Holstein X Sahiwal cows. Indian J Dairy Sci. 1997; 50:302-306.
2. Bhatnagar DS, Sharma RC. Reproductive status of Karan Swiss heifer. Agric. Sci. Digest. 1985; 5:57-59.
3. Cicordi V, Magnani G. Research on the seasonal behaviour of bovine fertility. Zootec. Vet., 18:234 Anim. Breed. Abstr. 1963; 32:172.
4. Hagevoort RG, Garcia AJ. When Should Dairy Cows Be Inseminated? 2013; Guide B-117:1-8 (Las Cruces, NM).
5. Harvey WR. Mixed models least square and maximum likelihood computer program. 1990.
6. Hillers JK, Senger PL, Darlington RL, Fleming WN. Effects of production, season, age of cow, days dry, and days in milk on conception to first service in large commercial dairy herds. J Dairy Sci. 1984; 67:861-867.
7. LeBlanc, Stephen J, Kene Leslie, Henry J Ceelen, David F Kelton, Gregory P Keefe. Measures of estrus detection and pregnancy in dairy cows after administration of

- gonadotropin releasing hormone within an estrus synchronization program based on prostaglandin F₂₅. *J Dairy Sci.* 1998; 81:375-381.
8. Mangurkar BR, Gokhale SB, Shindey DN, Pande AB and Phaduis YP. Reproduction performance of Holstein Friesian and Jersey pure bred cows in a herd in India. *Indian J Anim. Sci.*, 1985; 55:893.
 9. McDonald P. *Animal Nutrition*. 5th Edn., Longmen, Singapore, 1995.
 10. Mehrotra S, Dev A, Herbola PC. Conception rate in Holstein Friesian cattle and its Hariyana crosses under temperate climatic conditions of Kumaon hills. *Indian Vet. J.* 1999; 76:457-458.
 11. Pankowski JW, Galton DM, Erb HN, Guard CL, Girohn YT. Use of prostaglandin as a postpartum reproductive management tool for lactating dairy cows. *J Dairy Sci.* 1995; 78:1477-1488.
 12. Pursley JR, Mee MO, Wiltbank MC. Synchronization of ovulation in dairy cows using PGBr and GnRH. *Theriogenology.* 1995; 44:915-925.
 13. Radostits OM, Leslie KE, Feltrow J. *Herd Health Food Animal Production Medicine*. 2nd Edn. W.B. Saunders Co., Philadelphia, 1994.
 14. Roberts SJ. *Veterinary Obstetrics and Genital Diseases*. CBS Pub. and Distributors, India, 1986, 162.
 15. Stevenson JS, Call EP. Influence of early estrus, ovulation, and insemination on fertility in postpartum Holstein cows. *Theriogenology.* 1983; 19:367-375.
 16. Tomar SS. Variation in conception rate of deep frozen semen of Brown Swiss bulls. *Indian Vet. Med. J.* 1981; 5:145-147.