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Influence of non-genetic factors on calving interval in Gangatiri cattle breed at organized farm, Arajiline, Varanasi

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Abstract
The present study was conducted on "Influrnce of non-genetic factors on calving interval in Gangatiri cattle breed at organized farm, Arajiline, Varanasi". The data were collected from the history sheets of 40 cow maintained in State Livestock Cum Agricultural Farm Arajiline, Varanasi, for the period from 2003 to 2010 to determine the effect of period of birth and season of birth on lactation milk yield. A non-significant effect of period of birth and season of birth on calving interval.

Keywords: gangatiri cow, period of birth, season of birth, calving interval

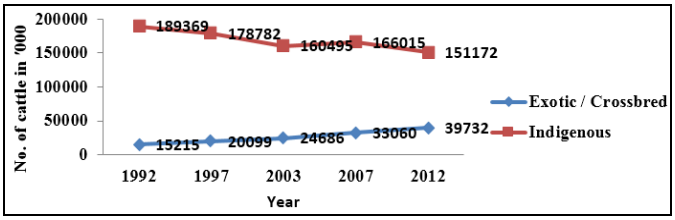
Introduction
India is a rural based country, two third of its population resides in rural areas. The rural economy mainly depends on agriculture. Animal husbandry and Dairy plays a prominent role in the rural economy through supplementing the income of rural households, particularly, the landless, small and marginal farmers in India. It also provides subsidiary occupation in semi urban areas and more so for people living in hilly, tribal and drought-prone areas where crop output may not sustain the family.

The annual milk production has touched an estimate of 76 million tones (Prasad, 2001) [10]. This increase in milk production has increased the daily availability of milk per capita 302 gms (19th Livestock Census). To supply the minimum requirement of milk, production of milk in the country needs to be increased to about nearly two and half times. The demand of milk can be met by increasing the production per animal and that can only be achieved by improved breeding and feeding practices. According to recent estimates, India ranks first, however, the per capita availability of milk/person/day is very low as compared to the recommended level 302 gms. The reason of this wide gap between the availability and recommendation is the low milk production potential of indigenous cattle. Therefor, there is great task before the scientists to evolve the means and technique with available limited resources to bridge up this gap to meet the growing demand of increasing population.

Milk production considered to be one of the most important traits in selection. There are many factors that cause narration in milk production, which can be classified into two main factors i.e genetic and environmental. The first factor include all differences which are attributed to heredity, genetic constitution and the phenotypic expression of gene while the second comprises all other causes of variations between as well as within individuals and reveal the climatic effect and manage mental practices given to the livestock.

More emphasis should be given to improve both the factors viz. genetic as well as non-genetic. The genetical improvement can be brought by selecting and breeding of superior stock having superior germplasm (genes) and non-genetical improvement can be obtained by providing the better climate as well as feed and health care.

Various indigenous breeds of cattle in country are the result of thousands of years of selection, evolution and development from wild species in the process of domestication to the local agro climatic conditions. These breeds are now losing ground due to intense competition to other breeds and risk of economic viability under the present system of management.



(***Source*: www.fao.org)**

Fig 1.1: Exotic / crossbred and indigenous population during 1992-2012

Gangatiri is an indigenous cattle breed of India, known to be originated in the region along the banks of Ganga river in eastern Uttar Pradesh and western parts of Bihar state. This is an important dual purpose breed of North India. The cows are fairly good milk yielders.

Gangatiri is also known as Eastern Hariana or Shahabadi. The breeding tract includes Bhojpur district of Bihar and Varanasi, Mirzapur, Ghazipur and Ballia districts of Uttar Pradesh. The animals of this breed are medium milk producers and possess good draft ability also. The color is complete white (Dhawar) or Grey (Sokan). The horns are medium sized and emerge from side of the poll behind and above eyes in outward and curving upwards and inwards ending with pointed tips. The forehead is prominent, straight and broad with shallow groove in the middle. Eyelids, muzzle, hooves and tail switch are generally black in color. The average milk yield in a lactation is around 1050 Kg, varying from 900 to 1200 Kg with an average fat of 4.9 %, varying from 4.1 to 5.2 %.

Calving interval is the time interval between the two consecutive calving and it is consisting of gestation period and service period. Since the variation in gestation length within a breed is small therefore, the variation in calving interval is almost due to the service period and these two intervals are highly correlated. Calving interval is defined as the period of time elapsing between two consecutive parturitions (Arthur, 2001; Gebrekidan *et al*., 2012 and Yifat *et al.*, 2012) [1, 3, 12].

Calving interval can be divided into three periods: gestation, postpartum anoestrus (from calving to first estrus) and the service period (first postpartum estrus to conception). Days open is the part of the calving interval that can be shortened by improved herd management (Malik, 1977) [6].

Statistical analysis

The raw data were entered and sorted into MS Excel sheet then transferred to the analytical Web Based Agricultural Statistics Software Package (WASP-2.0) for descriptive result. The fixed effects considered were year of birth and season of birth. All data were entered into Microsoft Excel spreadsheets and after deleting incomplete records, a total of 40+40 (period wise and season wise) records for Calving interval were used for analyses. Birth year of 2003-2004, 2005-2006, 2007-2008 and 2009-2010 and season winter, summer and rainy were taken for data analysis.

Results and Discussion

According to period of birth, overall least square mean calving interval was 483 ± 13 days. Which is similar to that reported by Nehra (2004) in Rathi cows, and almost similar observations were made by Roy (1983) [11].

The analysis of variance showed that the effect of period of birth were found non significant on calving-interval. According to period of birth, the calving-interval in four periods P1(2003-2004), P2(2005-2006), P3(2007-2008) and P4(2009-2010) were 497 ± 32, 488 ± 33, 479 ± 23 and 468 ± 34 days respectively. The calving-interval was lowest in P4 and highest in P1. The least square mean value of calving-interval were lowest in period P4 may be due to better feeding and scientific management during this time (2009-2010). When compared P1, P2, P3 and P4, period P1 with P2, P2 with P3 and P3 with P4 does not differ significantly.

Table: Period wise least square mean of calving interval (days).

		N	Least square mean	S.E (±)
Overall		40	482.85	±12.00
Period of birth	P1	10	496.5	±31.00
	P2	10	488.2	±33.00
	P3	10	479.0	±23.00
	P4	10	467.7	±34.00

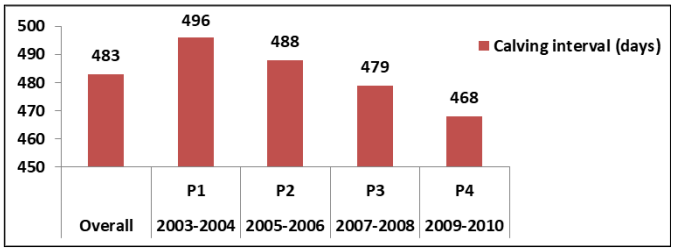


Fig: Period wise least square mean of calving interval (days).

The analysis of variance showed that the effect of season of birth were found non significant on calving-interval. According to season of birth, the calving-interval in seasons S1(winter), S2(summer) and S3(rainy) were 493 ± 19, 465 ± 16 and 472 ± 34 days respectively. The calving interval in the case was lowest in season S2 (March-June) and highest in season S1 (November-February). Comparision of S1 with S2, S2 with S3 and S3 with S1 does not differ significantly.

Table: Season wise least square mean of calving interval (days).

		N	Least square mean	S.E (±)
Overall		40	477	±08.00
Season of birth	S1	22	493.45	±19.00
	S2	06	465.50	±16.00
	S3	12	472.08	±34.00

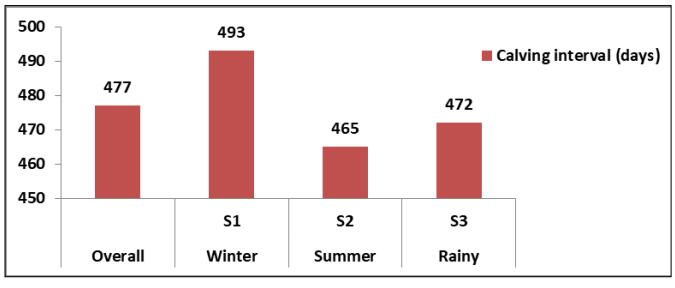


Fig: Season wise least square mean of calving interval (days).

Conclusion

The history and pedigree record formed the basis of the present study. The data for the present study was taken from State Livestock Cum Agricultural Farm, Arajiline, Varanasi. The data will be classified according to period and season of cow born. The data will be statistically analyzed and summarized using appropriate statistical technique.

The analysis of variance showed that the effect of period of birth were found non-significant on calving-interval. According to period of birth, the calving-interval in four period P1(2003-2004), P2(2005-2006), P3(2007-2008) and P4(2009-2010) were 497 ± 32, 488 ± 33, 479 ± 23 and 468 ± 34 days respectively. The calving-interval was lowest in P4 and highest in P1. The least square mean value of calving-interval were lowest in period P4 may be due to better feeding and scientific management during this time (2009-2010). The analysis of variance showed that the effect of season were found non-significant on calving-interval. According to season of birth, the calving-interval in seasons S1(winter), S2(summer) and S3(rainy) were 493 ± 19, 465 ± 16 and 472 ± 34 days respectively. The calving interval in the case was lowest in season S2 (March-June) and highest in season S1 (November-February).

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