Comparative Productive And Reproductive Performance Of Holstein Friesian And Jersey Crossbred Cows In Humid Sub-Tropics Of Chitwan Under Farmer's Managed Condition

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ABSTRACT

The objective of this study was to compare the productive and reproductive parameters of two genotypes (Holstein Friesian and Jersey crossbred cattle) in Chitwan district under farmers managed condition. Data on productive and reproductive traits like Milk yield in current lactation (LMY), Annual milk yield (AMY), Lactation length (LL) Age at first calving (AFC), Gestation length (GL), and Dry period (DP) were collected from 303 crossbred cows (131 Holstein crossbred and 172 Jersey crossbred) from households, smallholder's farms and commercial farms of Chitwan during the month of November 2014 to April 2015. Data collected were cleaned, coded, entered into MS-Excel and analyzed by using SPSS 16.0 software version. Results indicated that Milk yield in current lactation and Annual milk yield were significantly ($p<0.05$) affected by breed. That means milk yield in current lactation (3562.00±134.39 ltr.) and annual milk yield (3500±123.96 ltr.) were observed highest in Holstein crossbred cows as compared to Jersey crossbred cows. However, Lactation length, Age at first calving (AFC), Gestation length (GL) and Dry period (DP) were not affected by breed ($p>0.05$). The tendency of highest Lactation length (LL) (309.20±3.66 days), Gestation Length (GL) (297.60±8.93 days) and Dry period (DP) (72.74±9.78 days) were recorded in the Holstein crossbred cows whereas Age at First calving (AFC) (918.70±20.42) was comparatively higher in Jersey crossbred cows. Roughly similar feeding and managerial practices including short duration of study period during humid sub-tropics condition indirectly affected the findings of this study and need to perform the same task including more number of animals for a longer period of time for better output before recommendation.

Keywords: Productive; Reproductive, Holstein, Jersey, Performance.

INTRODUCTION

Livestock is raised for the purpose of milk, meat, eggs, wool, labor, etc. by smallholder farmers and also commercially in Nepalese context. In Nepal; Livestock along with its products like meat, milk, and hides solely contribute 11.5 % of national GDP (CBS, 2011), and 25.68% of the Agriculture GDP (MoAD, 2014). Livestock is an integral part of Nepalese farming which provides draught power, FYM, and household fuels also. Cattle are the major source of animal traction and dung/manure in Nepal. Though the largest mass of cattle was present in Nepal, the annual growth rate is almost zero as compared to other livestock farming. According to MOAC statistics (2011/12), the livestock population of cattle was about 7244944 with the annual growth rate of 0.42 percent during 2011/12. The cow is just used for the production of milk in Nepal. As cow is our national animal, it is not used as meat production in Nepal. During 2011/12; MoAC statistics showed that the population of milking cows and annual growth rate was 998960 and 1.8 percent respectively whereas cow milk production and its annual growth rate was 468913 MT and 3 percent respectively. Improvement and evolution of livestock primarily depend on genetic potential and better nutrition, control of disease, better management practices accelerate the genetic potential of the animal. The productivity of dairy cattle is mostly affected by climatic stress like; high heat stress, high humidity, and erratic rainfall in the tropics (Ansell, 1985).

Overall productive parameters are directly related to the reproductive parameters and a better environment is always necessary for the expression of the capability of animals. Any alteration in the environment seriously influences productivity via disturbing reproductive performances (Haque et.al. 2011). Hence, this study was carried out to compare the major important productive and reproductive traits of Holstein and Jersey crossbred cows in Humid subtropics of Chitwan under farmers managed condition. As the pheno-genetic evaluation of cattle breed has been scarcely estimated in Nepal, this study will estimate the best productive and reproductive traits and makes easy in arranging the suitable strategies for genetic improvement of cattle.

MATERIALS AND METHODS

The study was conducted in Chitwan district and the site was majorly situated in Khairahani Municipality, Chitrawan Municipality, Bharatpur Municipality, Narayani Municipality and Divyanagar VDC of Chitwan district. According to the Department of Hydrology and Meteorology Nepal, the study area was located in an altitude of 141-1943 masl with a temperature range of 18^0 C- 32.2^0 C. The data were collected from the smallholder's farms and households in the above-mentioned area during the month of November 2014 to April 2015. The information on the productive and reproductive performances of 303 cows of two genotypes was collected for this study. The experimental animal was divided into two genetic groups according to their genetic compositions, such as Jersey crossbred and Holstein crossbred. Management of herd and feeding in the smallholder's farms and households were roughly uniform throughout the year. As per the availability of grazing area, both the grazing and stall feeding was done all over the year. In the farms and households, cattle were provided with the concentrates feed twice a day. Concentrates mostly include wheat bran, rice bran, oil cakes (Mustard), salts and readymade pellet feeds in some commercial farms. Fodder/forages/grasses like Oat, Ipil (Lucaena species), Melia, Napier etc. were cultivated by the peoples in such area and provided to the cattle during its availability. Traits mostly closer with production and reproduction were focused for analysis like; Lactational Milk Yield (LMY), Annual Milk Yield (AMY), Lactational Length (LL), Age of Firs Calving (AFC), Gestation Length (GL) and Dry Period (DP). The collected information was entered into MS-Excel then coded and analyzed by using SPSS 16.0 version. Results obtained after analysis were compared and then identified the approximately better performance showing genotype for the recommendation.

RESULTS AND DISCUSSION

Milk Yield (MY)

The least-square means of Lactational Milk Yield (LMY) and Annual Milk Yield (AMY) inclusive of SE for both breeds are presented in table 1. The result showed that higher LMY (3562.00±134.39 ltrs.) was recorded in the HF crossbred cattle as compared to the Jersey crossbred cattle (2968.00±104.30 ltrs.). The highest AMY was also observed in Holstein crossbred (3500±123.96 ltrs.) and the lowest AMY was recorded in Jersey crossbred (3029.00±96.20 ltrs.). The least-squares analysis of variance showed that LMY and AMY were significantly affected by breed ($p<0.05$). That means genotype had a significant effect on lactational and annual milk production where annual milk yield was adjusted to 305 days of the standard lactation period. Milk yield of Holstein crossbred cows that obtained from the present study was almost similar with the findings of Haq et. al. 1993 (3643.28±121.26 ltrs.) which was performed in Kaspur, Pakistan during 1985-1991 in Friesian cattle. Sattar et. al. (2005) reported the lower milk yield in Friesian cattle as compared to the current findings of milk yield. Palladino et. al (2010) reported the higher milk yield (4422.50±161.65 ltrs.) in Jersey cattle under grazing conditions as compared to present findings. The fluctuations in the Milk yield is due to breeds, parity differences, LL, herd, climate, and few managerial practices.

Lactational Length (LL)

The Least square means of Lactation Length (LL) along with standard error was presented in Table 1. The result showed that the tendency of highest LL (309.20±3.66 days) was found in the Holstein crossbred cows whereas comparatively lowest LL (300.70±2.84 days) was observed in Jersey crossbred cattle. Analysis of Variance showed that breed had no significant effect ($p>0.05$) on lactation length. The estimates of the LL of Holstein crossbred cows of the present study were almost similar to the findings of Dabduab and Misra (1988) where they reported average LL of 303.2 days for pure-bred Friesian in Iraq. Perez and Ronda (1983) reported the higher LL (315±17.9 days) in Indian HF cattle as compared to the present findings. Gogoi et. al. (1993) recorded the bit highest lactation length in Jersey cattle in the hill country of Sri Lanka. However, LL greater than 305 days will hinder the calving interval and quite bit higher least square mean for LL observed in HF crossbred cattle in the present study shows that HF cows were not dried off at the proper time and continued to milk for bit extended period.

Table 1. Least Square means along with SE of Productive parameters of HF and Jersey crossbred cattle in humid sub-tropics of Chitwan under farmers managed condition (2014/2015).

Breed/Genotype	**Productive Parameters**		
	LMY (ltrs)	**AMY (ltrs)**	**LL (days)**

HF crossbred	3562.00±134.39	3500.00±123.96	309.20±3.66
Jersey crossbred	2986.00±104.30	3029.00±96.20	300.70±2.84
Sig.	S	S	NS

Where; S=Significant, NS=Non-Significant

Age at First Calving (AFC)

The Least square means of Age at First Calving (AFC) inclusive of SE was presented in Table 2. Analysis of Variance showed there is no significant difference ($p>0.05$) on AFC between both genetic groups. However, the tendency of shorter AFC (901.70±26.31 days) was observed in the Holstein crossbred cattle whereas analogously highest AFC (918.70±20.42 days) was recorded in Jersey crossbred cattle. Sandhu et. al. (2011) reported the almost similar finding of AFC (894.74±13.11 days) of Holstein crossbred cattle as compared to the present findings. Higher AFC (1237±0.00 days) were reported by Morsi et. al. (1986) in Friesian heifers. In the case of Jersey heifers, Njubi et. al. (1992) reported the bit highest AFC (31 months) as compared to the present findings. This fluctuation might be a cause of herd differences and timely mating via heat detection.

Gestation Length (GL)

The Least square means of Gestation Length (GL) together with SE was shown in Table 2. Analysis of Variance revealed that GL was poorly affected ($p>0.05$) by both genetic group i.e. there are no significant differences on GL between both crossbred cattle. However, the tendency of higher GL (297.60±8.93 days) was recorded in the HF crossbred cattle whereas comparatively lower GL (293.60±6.93 days) was seen in Jersey crossbred cattle. Majid et. al. 1995 also reported a non-significant variation in GL among different genotypes. Rahman et. al. (1987) found a range of GL of 270-285 days which is almost similar with results of present findings.

Dry Period (DP)

The least-square means of Dry Period (DP) along with SE was presented in Table 2. Analysis of variance showed statistically similar ($p>0.05$) DP for both genetic groups. But, the tendency of DP of HF crossbred cattle was a bit higher (72.74±9.78 days) as compared to the Jersey crossbred cattle (64.24±7.59 days). Abou-Bakr et. al. (2006) reported the lower DP (63.4 days) in Friesian cattle as compared to the DP of HF crossbred cattle in present findings. Hossain and Routledge et. al. (1982) observed the lower DP (57±29 days) in Jersey crossbred as compared to the DP of Jersey crossbred obtained from present findings. In the present study, the DP of cows were long in comparison with other pure crossbred cows. The variation is mainly due to the genetic fraction of cattle (i.e. genetic purity/percentage alteration cause of improper breeding in some HHs) and hot-humid condition. Relatively, shorter DP is always necessary to get the fruitful advantages from the cattle in commercial farms.

Table 2. Least Square means along with SE of Reproductive parameters of HF and Jersey crossbred cattle in humid sub-tropics of Chitwan under farmers managed condition (2014/2015).

Breed/Genotype	**Reproductive Parameters**		
	AFC (days)	**GL (days)**	**DP (days)**
HF crossbred	901.70±26.31	297.60±8.93	72.74±9.78
Jersey crossbred	918.70±20.42	293.60±6.93	64.28±7.59
Sig.	NS	NS	NS

Where; S=Significant, NS=Non-Significant

CONCLUSION

The results of observed traits were statistically similar between crossbred cattle however, Lactational Milk Yield (LMY) and Annual Milk Yield (AMY) was statistically different. Conclusively, better milk yield including slightly longer Lactation Length (LL) and short Age of first calving (AFC) was observed in the HF crossbred cattle whereas Gestation Length (GL) and Dry Period (DP) tended to lower/shorter in Jersey crossbred cattle in humid sub-tropics of Chitwan under farmer-managed conditions. As feeding and management in the households and commercial farms of study area were roughly similar and short study period during humid sub-tropics in the scattered area might lead to statistically similar findings except LMY and AMY. To get a better output in productive and

reproductive efficiency, proper management and care are genuinely needed in terms of feeding, breeding, housing, and health services.

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