EFFECT OF PARITY ON THE YIELD, FAT AND SNF CONTENT OF MILK IN HOLSTEIN FRIESIAN CROSSBRED COWS

RAJIB KRO*, N.B. PATEL, T.K.S RAO and MONICA TISSOPI¹

Department of Livestock Production and Management,

Vanbandhu College of Veterinary Science and Animal Husbandry, Navsari Agricultural University, Navsari-39645, India ¹Department of Livestock Production and Management,

College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-781022, India

Received: 02.09.2019; Accepted: 17.06.2020

SUMMARY

The present study was carried out to evaluate the effect of parity on the yield, fat and SNF content of milk in Holstein Friesian (HF) crossbred cows. The study was conducted in two groups of HF crossbred cows with Group-1 consisting of six nos. of primiparous cows and Group-2 consisting six nos. of multiparous HF crossbred cows. Four fortnightly test-day milk yield records were considered with a fortnightly test-day interval of 15days for 2-months. The results of the study showed that the milk yield (kg) was significantly (P<0.01) higher in multiparous as compared to primiparous cows. The overall fat % was significantly higher in primiparous as compared to multiparous cows with overall SNF % higher in multiparous as compared to primiparous cows though it was not-significant. Thus, based on all the findings it can be concluded that parity has an influence on milk yield and fat content of milk of HF crossbred cows while SNF content of milk was not influenced by the parity.

Dairying plays a major role in Indian rural economy. Dairying in India is more than a business; it has broader social and economic dimensions. Currently, India is the world's largest producer (163.7 million MT in 2016-17) and consumer of milk accounting for 19 % of the world milk production (Vision 2022, 2019). The exotic and cross bred animals contribute nearly 26.19 % of the total cattle population (192.49 million) in India (20th Livestock Census, 2019). Holstein Friesian crossbred cows are one of the high yielding categories of cattle in India.

Parity may potentially affect the nutrient digestibility and productivity of lactating dairy cows. Study of Mingoas et al. (2017) showed that udder size is strong and positively correlated to milk yield. The first lactation cows had lowest milk production and highest production occurred in 5th parity (Wondifraw et al., 2013). Milk fat and protein levels were more in advance parities indicating significant effect of parity on milk composition (Yadav et al., 2013). Also parity affects the SNF and protein yields (Sudhakar et al., 2013). Information about variation of milk composition in relation to parity and lactation stage in crossbred cattle is scant. The present study was designed to assess the effect of parity on the yield, fat and SNF content of milk in HF crossbred cows.

The present investigation was conducted at Bhestan farm, located in Surat District of Gujarat, on two groups of crossbred HF cows. Each group consists of 6 no. of animals, with group 1 consisting of six primiparous and group 2 six multiparous HF crossbred cows. The animals

were solely fed on Total Mixed Ration twice daily i.e. 8.00 am and 4.00 pm, respectively with 24 hours free-access to clean drinking water. Milk yield (kg) of individual HF crossbred cow was recorded on daily basis, twice daily i.e. morning and evening at 2:30 am and 2:30 pm hours by electronic weighing balance, starting from 7th day after parturition till entire study period of 2 months. Four fortnightly test-day milk yield records were considered with a fortnightly test-day interval of 15 days starting from days 22, 37, 52, and 67 of lactation. The calves were permitted to suckle for few minutes before let down of milk and 5 minutes after each milking. Suckling calves of all the experimental animals were weighed at fortnightly interval before and after suckling on digital weighing balance. The difference in body weight was considered as the amount of milk suckled by the HF calves. The sum of amount of milk suckled by each HF calf during morning and evening milking gave amount of milk that HF calf had suckled from its dam on that day.

Milk samples were analysed at the fortnightly interval for its composition. Analysis of milk fat % was done with the help of Fatometer Milk Analyser and specific gravity by using lactometer for getting Corrected lactometer reading (SNF calculation Richmond's formula used). One way-ANOVA procedure was undertaken to compare means. Post Hoc multiple comparisons were made using Duncan New Multiple Range Test. Independent sample t-test was used for two group comparisons (SPSS, verion 20.0).

Perusal of the results revealed that overall milk yield

^{*}Corresponding author: zebra6951@gmail.com

(kg) in primiparous (8.57±0.08 kg) and multiparous (11.22 ± 0.21 kg) cows showed significant (P<0.01) difference between the group. The highest milk yield was noted during 4th fortnight (8.81 ± 0.20 kg) and lowest during 1st fortnight (8.33±0.10 kg) in primiparous cows, however it was highest during 3rd fortnight (11.79±0.38 kg) and lowest during 1st fortnight (10.29 ± 0.38 kg) in multiparous cows. On different fortnights, multiparous cows produced significantly higher milk than its primiparous counterpart. The findings indicated that parity has an influence on the milk yield of HF crossbred cows.

The findings of present study is in agreement with Sourabh *et al.* (2016) who found that primiparous cows had lower milk yield than multiparous cows. Contradictory to this, Bach *et al.* (2006) in his study reported that milk production (25.9 vs. 25.6 ± 0.8 kg/d) were similar in both the multiparous and primiparous groups. The low milk production of primiparous cows in the present study could be due to its growing stage, as in mature animals mammary parenchymas were more developed due to optimum hormonal levels, as stated by Pal *et al.* (2019) in his studies that hormones affect the proliferation and death of mammary cells and also their secretory activity.

The overall milk fat (%) was significantly (P<0.01) higher in primiparous $(3.83\pm0.09\%)$ as compared to multiparous $(3.47\pm0.09\%)$ cows. Further more, the fat (%) was found in decreasing trend from 1st to 4th fortnight (4.27 ±0.11, 3.85±0.11, 3.70±0.11, 3.50±0.17%) in primiparous cows, similar trend was observed from 1st to 3rd fortnight (3.80±0.19, 3.40±0.14, 3.28±0.13%) and a slight increase on 4th fortnight (3.40±0.18%) in multiparous cows. The above findings indicated that milk fat of HF crossbred cows was affected by the parity.

The result of present study is in agreement with Sourabh *et al.* (2016) who observed significantly higher fat % in milk of primiparous as compared to multiparous cows.

In contrary to this, Jash (2008) in a study reported that fat (%) was highest in 6th lactation (3.81 ± 0.03) followed by 5th (3.75 ± 0.03), 4th (3.64 ± 0.03), 2nd and 1st (3.59 ± 0.02) although the difference was not-significant. The overall SNF (%) was higher in multiparous as compared to primiparous cows (7.87 ± 0.05 vs 7.84 ± 0.04 %) though it was statistically not-significant. The fortnights' observation of SNF (%) of the groups was also not-significantly different in both the groups. Parity showed no significant effect on the SNF-constituent of milk of HF crossbred cows. Results of present finding are similar with Afzal *et al.* (2007). He found that parity had no-significant effect on SNF and other milk constituents.

From the findings it can be concluded that parity has an influence on the milk yield and fat % while SNF was not influenced by the parity and that with the advancement of lactation, a cows' body becomes more developed to adapt to the parturition stress, which is reflected in their milk production performance.

REFERENCES

- 20th Livestock Census. (2019). All India report.GOI, Ministry of Agriculture, DAHDF, Krishi-Bhavan, New Delhi.
- Afzal, M., Anwar, M. and Mirza, M.A. (2007). Some factors affecting milk yield and lactation length in Nili Ravi buffaloes. *Pakistan Vet. J.* 27(3): 113-117.
- Bach, A., Iglesias, C., Devant, M. and Rafols, N. (2006). Performance and feeding behaviour of primiparous cows loose housed alone or together with multiparous cows. J. Dairy Sci. 89(1): 337–342.
- Jash, S. (2008). Behavioural pattern and performance of crossbred cows in community machine-milking parlours. Ph.D. Thesis Submitted to ICAR-NDRI, Deemed University, Karnal, India.
- Mingoas, K.J., Awah-Ndukum, J., Dakyang, H. and Zoli, P.A. (2017). Effect of body conformation and udder morphology on milk yield of Zebu cows in North Region of Cameroon. *Vet. World.* 10(8): 901-905.
- Pal, P., Ghosh, S., Grewal, S., Sahu, J. and Aggarwal, A. (2019). Role of hormones in persistency of lactation: a review. J. Entomol. Zool. Stud. 7: 677-683.
- Sourabh, Y., Shankar, S.S., Kumar, C.S., Om, P. and Jain, S. (2016). Effect of season, lactation and parity on yield and major components of raw milk in crossbred Holstein Friesian cows. *Int. J. Agri. Sci.* 8(62): 3536-3539.
- Sudhakar, K., Panneerselvam, S., Thiruvenkadan, A.K., Abraham, J. and Vinodkumar, G. (2013). Factors effecting milk composition of crossbred dairy cattle in Southern India. *Inter. J. Food, Agric. Vet. Sci.* 3(1): 229-233.
- Vision 2022. (2019). National action plan for dairy development. DAHDF, Ministry of Agriculture and Farmers' Welfare. GOI, Krishi-Bhavan, New Delhi.
- Wondifraw, Z., Thombre, B.M. and Bainwad, D.V. (2013). Effect of non-genetic factors on milk production of Holstein Friesian Deoni crossbred cows. *Int. J. Livest. Prod.* 4(7): 106-112.
- Yadav, S.P., Sikka, P., Kumar, D., Sarkar, S., Pandey, A.K., Yadav, P.S. and Sethi, R.K. (2013). Variation in milk constituents during different parity and seasons in Murrah buffaloes. *Indian J. Anim. Sci.* 83(7): 747-751.