Scientific Papers. Series D. Animal Science. Vol. LXI, Number 1, 2018
ISSN 2285-5750; ISSN CD-ROM 2285-5769; ISSN Online 2393-2260; ISSN-L 2285-5750

VARIATION IN MILK PRODUCTION OF BROWN SWISS COWS BY CALVING SEASON, STAGE OF LACTATION AND YEAR

Ibrahim Cihangir OKUYUCU, Huseyin ERDEM, Savas ATASEVER

Ondokuz Mayis University, Faculty of Agriculture, Department of Animal Science, 55139, Samsun, Turkey

Corresponding author email: satasev@omu.edu.tr

Abstract

The objective of the present investigation was to determine the change of milk production by calving season, stage of lactation and year in Brown Swiss cows. The research was carried out on Brown Swiss cows (n=30) reared at a private farm in Konya region of Turkey. Daily milk yield (DMY) values of the current lactation and lactation milk yield (LMY) values of initial two years (2015 and 2016) were assessed to be milk production parameters. To evaluate DMY, two stage of lactation (SL; 1=<157d and 2=≥157d) and calving season (CS; 1=from March to August and 2=from September to February) groups were designed. Group differences were tested by independent-samples t-test in SPSS. DMY means for SL1, SL2, CS1 and CS2 were calculated to be 20.25 kg, 17.79 kg, 17.85 kg and 19.69 kg, respectively. LMY means of two years were estimated to be 4975.53 kg and 5961.80 kg, respectively (P<0.001). It was concluded that milk yield level was positively affected by years in the evaluated dairy farm.

Key words*: Brown Swiss, environmental factor, dairy farm, milk yield.*

INTRODUCTION

As well known, animal production not only ensures essential foods, but also provides a great large scale occupation for human. At this point, high-grade livestock products such as milk, beef, egg or honey are highly demanded. Today, obtaining quality and quantity products carries equal importance by conscious suppliers.

Many cattle breeds have been raised throughout the world because of their different yields. In spite of Holstein is the most popular breed among the cattle breeds, Simmental, Jersey, Angus, Hereford or Brown Swiss may be classified as the other common ones. For example, Simmental and Brown Swiss are considered to be dual purposes (beef and milk). However, multi non-genetic factors, such as season, parity, stage of lactation or location may be effective on the productivity of cows. While Baul et al. (2010) calculated relatively lower milk yield in the first parity cows, Vijayakumar et al (2017) estimated the highest milk production from Korean Holstein cows in the early lactation period (55 to 90 d). Aksu and Atasever (2017) pointed out to seasonal changes of milk production of Holsteins in Turkey conditions.

Thusly, removing adverse factors influencing the production level of animals can be seen a great step to reach real genetic potentials of the cows.

The objective of this research was to determine the variation of milk production by calving season, stage of lactation and year in Brown Swiss cows in Turkey conditions.

MATERIALS AND METHODS

This study was conducted on Brown Swiss cows (n=30) reared at a private farm in Konya region of Turkey. All cows were clinically healthy and in the second or third parities. In the farm, the cows were milked two times in a day using automatic milking and kept the similar conditions by feeding and other practices during the research period. Daily milk yield (DMY) values of the recent lactation and lactation milk yield (LMY) values of initial two years (2015 and 2016) were evaluated as milk yield parameters. To examine DMY, two stage of lactation (SL; 1=<157d and 2=≥157d) and calving season (CS; 1=from March to August and 2=from September to February) groups were constructed. Differences between the groups were tested by independent-samples *t-test* in SPSS for windows packet program.

RESULTS AND DISCUSSIONS

In this study, means of DMY by CS and SL are given in Table 1. As seen, cows calved in the second period had about 1.84 kg more milk per cow when compared to those calved in the first period. This case indicates the positive effect of the cooler seasons on milk production of cows in the post-calving period. However, this difference was not found to be statistically significant. The findings here were not found to be parallel with the results of Rios-Utrera et al. (2013), who determined the DMY as significantly greater in cows that calved during the cold season than in those calved in the dry and rainy seasons. Similarly, Elahi Torshizi (2016) emphasized the higher level of milk production in cows which calved in autumn and winter.

Table 1. Means of DMY by two environmental factors

Factor	n	Mean (±*SE*)
CS		
1	11	17.85±0.77
2	19	19.69±0.97
SL		
1	15	20.25±1.05
2	15	17.79±0.79
General	30	19.02±0.69

CS: calving season (1= between March and August, 2= between September and February)
SL: stage of lactation (1=<157d, 2=≥157d)

It was also determined that cows in the first SL group had about 2.46 kg more milk production per cows with reference to the those of the second group (Table 1). As mentioned earlier, cows are exposed to peak milk production during the post-partum period. However, lactation persistency tended to gradually dropping after 60th day. In spite of the obtained variation between two DMY means by SL might be caused by this probability, this difference was not found to be significant, statistically. However, it was attractive in our study that the overall mean of DMY was calculated to be relatively low for Brown Swiss cows. Bergamaschi et al. (2015) emphasized in their study that Brown Swiss cows had more production capacity, according to applying management especially for the feeding program. At this point, redesigning the possible non-genetic factors related to feeding, husbandrial practices or barn conditions may be suggested for the responsible of the investigated farm in this research.

Effect of year on milk production was determined to be statistically significant (P<0.001). Change of LMY according to years is presented in Figure 1. Really, LMY means of chosen cows in 2016 (5961±151.04 kg) were 16.5% higher than those produced in 2015 (4975±122.43 kg).

This finding clearly revealed that husbandry conditions and herd management have tended to improve year by year.

This finding was found as harmonic with our opinions in the earlier paragraph in which the relationship of milk yield with herd management was pointed out.

Besides, calculated average of two years (5468.67±115.81 kg) was found to be higher than the results of some researchers (Dogan and Kaygisiz, 1999; Cak and Yilmaz, 2015), who carried out the studies on the same breed in Turkey conditions.

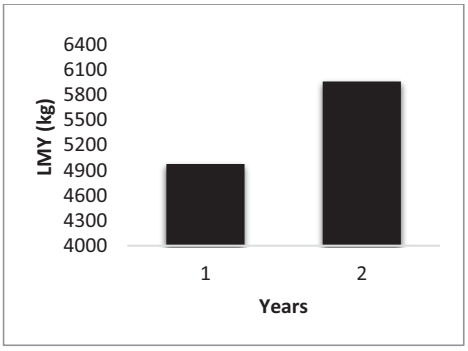

Figure 1. Change of LMY by years (LMY: lactation milk yield; Years: 1=2015 and 2= 2016)

CONCLUSIONS

In this study, Brown Swiss herd reared in Konya province of Turkey was investigated by three non-genetic factors affecting milk production.

It was concluded that milk production was positively influenced by year in the studied Brown Swiss herd.

To ensure more productive cows in the later times, exactly tracking the herd according to entire environmental factors may be advised to the herd owners.

REFERENCES

Aksu C., Atasever S., 2017. Changes of comfort parameters and test day milk yield in Holstein cows. Scientific Papers. Series D. Animal Science, Vol. LX, 145-147.

Baul S., Cziszter L.T., Acatincai S., Cismas T., Gavojdian D., Tripon I., Erina S., Buzamat G., 2013. Effect of Parity on Dynamics of Milk Yield and Composition during Normal Lactation in Dairy Cows. Sci. Papers: Anim. Sci. Biotechnol., 46(2), 285.

Bergamaschi M., Aprea E.,Betta E., Biasioli F., Cipolat-Gotet C., Cecchinato A., Bittante G., 2015. Effects of dairy system, herd within dairy system, and individual cow characteristics on the volatile organic compound profile of ripened model cheeses. J. Dairy Sci., 98, 2183-2196.

Cak B., Yilmaz O., 2015. Milk yield performances of Brown Swiss cows raised at Mus Alpaslan State Farm in Turkey. Bulg. J. Agric. Sci., 21 (2), 436–439.

Dogan M., Kaygisiz A., 1999. Relationships between milk yield traits and milk protein polymorphism in Brown Swiss Cattle in Turkey. Turk. J. Vet. Anim.Sci., 23 (Suppl. 1), 47-49.

Elahi Torshizi M., 2016. Effects of season and age at first calving on genetic and phenotypic characteristics of lactation curve parameters in Holstein cows. J. Anim. Sci. Technol., 58, 8.

Ríos-Utrera A., Calderón-Robles R.C., Galavíz-Rodríguez J.Y., Vega-Murillo V.E., Lagunes-Lagunes J., 2013. Effects of Breed, Calving Season and Parity on Milk Yield, Body Weight and Efficiency of Dairy Cows under Subtropical Conditions. Int. J. Anim. Vet. Adv., 5(6), 226-232.

Vijayakumar M., Park J.H., Ki S.K., Lim D.H., Kim S.B., Park S.M., Jeong H.Y., Park B.Y., Kim T., 2017.The effect of lactation number, stage, length, and milking frequency on milk yield in Korean Holstein dairy cows using automatic milking system Asian-Australas. J. Anim. Sci., 30(8), 1093-1098.