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Effect of Season, Parity, Exotic Gene Level and Lactation Stage on Milk Yield and Composition of Holstein Friesian Crosses in Central Highlands of Ethiopia

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Abstract

The study used twelve years recorded data's analysis for milk yield and composition of Holstein Friesian crossbreddairy cows in Holleta agricultural research center dairy farm.Data were summarized and categorized into the season, genotype (exotic blood level), Parity and lactation stages.The summarized data's were season (219 wet, 1055 dry),genotype (1,117 for 50%, 115 for 62.5% and 42 for >75%),Parity (474 for parity-2, 356 parity-3, 270 for parity-4 and 174 for parity-5), Lactation stage (483 for early, 445 for midand 346 for late). Analysis of means and standard errors of the mean for the parameter studied was estimated using SAS. The General Linear Model was used for analyses of variance on average monthly milk yield and composition for the effects of season, parity, genotype and stages of lactation. Season significantly affected milk yield, fat, and advances. Mean monthly milk yield, percent of protein and total solid was varied significantly between different lactation stages where protein and Total solid percentage was significantly higher in the late stages of lactation. Inoverall milk, the yield was significantly affected by season, genotype, parity and stages of lactation but it is negatively correlated with the percentage of fat, protein, and total solids.

Keywords

Milk yield; Milk composition; Season; Genotype; Parity and lactation stage

protein% during the wet season. Genotype significantly affected milk yield where the yield of 62.5% and >75% crossbred cows were significantly higher than that of 50% crossbred cows. The difference in parity significantly affected milk yield and protein content of milk where higher milk yield and protein content was recorded in parity five. An increasing trend observed in milk yield and protein content as dam parityprotein percentage composition. Higher yield and fat% composition record in the dry season and higher

Introduction

Ethiopia is the largest livestock producer in Africa having more than 59.5 million cattle, 30.70 million Sheep, 30.20 million Goats, 2.16 million Horses, 8.44 million Donkeys, 0.41 million Mules, and about 1.21 million camels and 56.53 million poultry [1]. Currently, the country production is estimated to be 1,128 Metric Tones (MT) of meat, 174 million eggs and 5.2 billion litres of milk per year [2]. The direct contribution of livestock to GDP is estimated by LSIPT at ETB 150.7 billion per year, which amounts to 17% of GDP and 39% of the agricultural GDP.

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This rises to about 21% of the national GDP and 49% of the agricultural GDP if the contribution of processing and marketing (35.6 billion) is taken into account. Having this amount of shares, its contribution to the Ethiopian livestock sector in general and the dairy sector, in particular, is below its potential at both the national and household level (Behnkle, 2010). To meet the everincreasing demand for milk, milk products and their contribution to economic growth, genetic improvement of the indigenous cattle has been proposed as an option. Hence, with the aim of this, crossbreeding has been practiced for the last five decades for increasing milk output. Milk, one of the physiological products of cows, varies in amount and composition of produced during the lactation period can be affected by feeds [3,4] seasons [5-7] genotype [8-10] stage of lactation [6,11-13]. There is no enough information available to understand the effect of non-nutritional factors on milk yield and composition of crossbred cows in Ethiopia. Therefore, it necessitates doing the present data analysis to investigate the effect of season, genotype, parity and lactation stages on milk yield and composition of Holliston Friesian crossbred dairy cows kept under similar management.

Result and Discussion

This paper was tried to show the effect of season, the bloodlevel of Holstein Friesian cross, parity and stages of lactation on milk yield and composition. Effects of season on milk yield and composition of dairy cowsThe effects of season on milk yield and milk composition of dairy cows are presented. A significant mean difference ($p<0.05$) was observed in milk yield, percent of fat and protein due to season. Higher yield and percent fat were recorded during the dry season but for protein during the wet season. As a result of this study, the season didn't significantly affect milk percentage composition of total solid. Opposing this finding [14] reported that season didn ' t affect milk yield. a Similar finding was reported by that the overall mean for the fat content of milk was 4.53 percent which was almost similar (4.66) with this study [12].

Conclusion

In overall from the findings, it can be concluded as milk yieldsof cows were significantly affected by season, exotic gene blood level, dam parity, and lactation stage. Season influenced Fat and protein percentage. Season, Parity and lactation stage significantly influenced milk protein percent whereas Fat% was more significantly affected by season. Milk yield and fat% significantly influenced due to the interaction of season with genotype whereas interaction of parity with the lactation stage significantly influenced percent for total solid of milk. Moreover, milk yield negatively correlated with the percentage of fat, protein, and TS. The percentage of fat positively correlated with the percentage of protein and Total solid and vise-versa.

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