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EFFECTS OF CALVING SEASON ON MILK YIELD OF HOLSTEIN COWS RAISED AT DALAMAN STATE FARM IN TURKEY*

H.AKÇAY¹, M.İLİSLAN¹, A.KOÇ¹

ABSTRACT

Data of 866 lactations collected from 251 cows raised at Dalaman State Farm in Muğla province between 1989 and 1996 were analyzed. Two calving seasons were determined on data set based on average monthly air temperature. These are the first calving season (November 1st - April 30th) which is within the comfort zone for cows, and the second calving season (May 1st - October 31st). Milk yield, calving year, lactation number and calving season were evaluated. The effect of lactation number ($p<0.01$), calving year ($p<0.01$) and, calving season ($p<0.01$) on 305-d milk yield were found statistically significant. The least-square means and standard errors of milk yield for the first and the second calving season were 7493.54 ± 70.29 kg and 7180.63 ± 81.08 kg, respectively.

Key words: Calving season, milk yield, holstein

Dalaman Tarım İşletmesinde Yetiştirilen Siyah-Alacalarda Buzağılama Mevsiminin Süt Verimine Etkisi

ÖZET

Muğla İli Dalaman Tarım İşletmesinde 1989 - 1996 yılları arasında yetiştirilen 251 hayvana ilişkin toplam 866 laktasyon verileri toplanarak değerlendirilmiştir. Aylık ortalama hava sıcaklıkları dikkate alınarak iki buzağılama mevsimi oluşturulmuştur. Bunlar, konfor sınırları içerisinde olan 1. buzağılama mevsimi (01 Kasım - 30 Nisan) ve 2. buzağılama (01 Mayıs - 31 Ekim) mevsimidir. Süt verimleri, buzağılama yılı, laktasyon sayısı ve buzağılama mevsimi değerlendirilmiştir. Yapılan değerlendirmede 305 günlük süt verimine laktasyon sayısı ($p<0.01$), buzağılama yılı ($p<0.01$) ve buzağılama mevsiminin etkisi ($p<0.01$) önemli bulunmuştur. Süt verimine ilişkin 1. ve 2. buzağılama mevsiminin en küçük kareler ortalamaları ve standart hataları sırasıyla 7493.54 ± 70.29 kg ve 7180.63 ± 81.08 kg olarak belirlenmiştir.

Anahtar kelime: Buzağılama mevsimi, süt verimi, Siyah-Alaca

Introduction

Milk and meat is mainly produced for the cattle in Turkey. The cattle population of Turkey contributes 21,5% of total livestock population accounting for 11,8 million heads (Anonymous, 1996). The percentage of cows in the cattle population in Turkey is about 50%, accounting for 5,9 million heads. The population is composed of exotic breeds (15,1%), native breeds (43,6%) and, native and exotic crosses (41,3%) (Anonymous, 1996). The percentage of the cow milk in the total milk production is rising highly in recent years in Turkey.

Dalaman State Farm located in the western part of Turkey called as Aegean Region has a large cattle population to develop the milk yield per cow to a higher amount. This research was conducted at Dalaman State Farm in Muğla province between the years 1989 and 1996 to determine the effects of calving season, calving year and lactation number on milk yield of Holstein cows in Turkey.

Material

The material of this research has obtained from collecting data belonging to cattle raised at Dalaman

State Farm. 305-d milk yield were computed. 2833 lactation records of 1119 cows were used between 1984 and 1997. Missing test days lactation records (1239), incomplete lactations (667) and, lactation lengths less than 270-d (61) were ignored in the 305-d milk yield calculation. As a result of elimination, data for 866 lactations of 251 cows were found suitable for evaluation.

Method

The statistical model of the analysis is used for calculations (Düzgüneş et al., 1987; Düzgüneş et al., 1991);

$$Y_{ijkl} = \mu + I_i + S_j + Y_k + e_{ijkl}$$

Two calving seasons were determined on data set based on monthly average air temperature. These are the first calving season (November 01st - April 30th) which is within the comfort zone for cows, and the second calving season (May 01st - October 31st). The averages of air temperature in the months of the first calving season are between +10 C and +19 C. This zones are called as comfort zone for cattle (Ensminger, 1980; Sainsbury, 1986; Schmidt et al., 1988). It was found that the averages of air temperature in the

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¹ Adnan Menderes University, Faculty of Agriculture, Animal Science Department, TR09100, Aydın, TURKEY

second is higher than the first and, it is considered that the performances of cows in this season is affected by the high air temperature.

Results and Discussion

Average lactation length was found 335,03±0,72 days and, the longest lactation was 462 days. 305-d milk yield average of the herd was found 7337,08±53,66 kg on milk production, 305-d some environmental effects such as lactation number, calving season and years of calving were found statistically significant ($p<0,01$). Interactions between calving season and lactation number, calving season and year of calving were found insignificant. Cows in the first calving season were produced 312,9 kg more milk than the second and, found statistically significant ($p<0,01$). These results agree with the other results (Ahn et al., 1994; Dass and Sharma, 1994; Kemenes et al., 1994; Martin and Bhuiyan, 1994; Nigm et al., 1994; Patel and Triphati, 1994; Pilipenko et al., 1994; Sadek et al., 1994; Soliman, 1994; Sreemannarayana and Rao, 1994; Şekerden ve Erdem, 1994; Singh, 1995; Uğur et al., 1995; Ali et al., 1996; Arora et al., 1996; Govindaiah et al., 1996; Jatt et al., 1996; Malau et al., 1996). Least-square means and standard errors of 305-d milk yield for calving season were calculated as 7493,5±70,3 kg and 7180,6±81,1 kg for the first and second calving season, respectively.

Conclusion

In conclusion, calving season has an effect on 305-d milk production. This is because of high environmental temperature and high humidity in summer months in Mediterranean climates. By changing some management practices such as preferring the first season as calving season will be beneficial. In addition to that some of the losses can be saved with an additional investment i.e., evaporative cooling etc. Yıldız et al. (1999) estimated that the losses is between 101 and 400 kg of milk in summer season and added that about 70% of the milk losses can be saved back with evaporative cooling. The cooling system costs should be taken in consideration.

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Table 1. Number of lactations (NL) and milk yields (MY) in calving seasons, years of calving and, lactation numbers.

Calving seasons	NL day	MY kg	Years of calving	NL day	MY kg
1 st calving season	416	7493.54± 70.29	1989	74	6602.86±143.65
2 nd calving season	450	7180.63± 81.08	1990	118	6649.73±116.26
Lactation number	NL day	MY kg	1991	132	7463.57±113.67
1 st lactation	192	6614.48±101.68	1992	144	7280.49±106.16
2 nd lactation	198	7182.79± 96.57	1993	143	7870.81±104.60
3 rd lactation	168	7465.80±101.28	1994	129	8702.27±112.90
4 th lactation	125	7757.05±118.38	1995	104	7477.48±125.75
5 th + lactation	183	7665.30± 97.35	1996	22	6649.45±288.64

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